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THE TREATMENT OF MELENA NEONATORUM BY HUMAN BLOOD SERUM.

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While the word melena forms an integral part of the title of this paper, it is to be understood that it is used out of respect alone for its position in a nomenclature which is scientifically a thing of the past. The type of case the subject of this communication does sometimes show this symptom, melena, as a major manifestation, but more often as only a very minor one. Possibly it would be more exact to give the title hemorrhagic disease or diathesis to this symptom-complex, but it is to be remembered in forming one's conception of the matter that the general symptom hemorrhage may be but a minor expression of this diseased condition during life, and in fact that it may be entirely absent clinically, only appearing upon post-mortem examination.

The clinical picture presented by these cases is most striking. The insidiousness of onset it is true is often diagnostically deceptive, but the rapid development of grave symptoms soon banishes any attempt to belittle the condition of affairs. Strangely enough the babies who have developed this diseased condition have almost without exception in our experience been most beautiful specimens at birth, normal or above in both weight and strength. It may also be noted in passing that the labors in the vast majority of these cases have been easy.

A few days after birth, however, it is observed that the child has some slight temperature; the stools are also of a faulty color, either being dark-green or containing blood, which may be either occult or frank. A papular eruption is to be found in a large proportion of the cases as a rather early symptom, and this may afterward become a true hemorrhage into the subcuticular tissue. Anorexia, vomiting, and indeterminate nervous symptoms are also of course in evidence, and in a large number of the cases bleedings from various parts of the body make their appearance. Any or all of the mucous and serous membranes may be the site of this hemorrhage.

The most usual sites of bleeding are the skin, as has been mentioned, the cord or umbilical ulcer, the vagina, the bowel, and, as in one instance of the writer's, the mucosa of the alimentary tract high up, the blood flowing from the mouth of this child in a steady little stream. Keeping pace with these alarming symptoms there is a progressive emaciation and weakness, which in a period of no more than forty-eight hours changes the child from a condition of exuberant health to that of extreme malnutrition.

In the experience of the writer, comprising about a dozen cases, there has been no benefit from any form of treatment except in the one case to be reported. With the just mentioned case as an exception all the other babies have died within a week of the onset of symptoms. The writer's mortality has therefore been one hundred per cent, and this in general has been the experience of most other observers, at least until within a very recent period. DeLestre reports a few cures by the withdrawal of a

small amount of blood, and Cope, working under Hamill, has in one instance seen the same remarkable result. In general, however, the prognosis has been considered practically hopeless.

As yet there is no etiology established with certainty. In former times when Buhl's and Winckel's diseases were considered pathological entities the way seemed plain enough. Syphilis, cerebral injuries, hemophilia, etc., were confidently believed to be the causes of this condition, and the spirit of investigation was stilled. A little later, however, this confidence began to weaken, and the same diseased conditions were not considered as truly causative but simply as predisposing factors, while at the present day all consideration has been withdrawn from them as in any way concerned, since any one having experience with the manifestation of pathology which we are considering will be impressed by the fact that in the large proportion of the cases the children are particularly healthy at birth. To the writer's mind the preponderance of probability tends toward an explanation in which septic infection plays the true initial rôle, the blood changes and other manifestations, varying as they do more or less with each case, being simply expressions of different varieties or doses of poison. This theory, while it does not explain all the manifestations, and while there are links in the evidential chain yet to be supplied, seems to fit the clinical picture better than does the theory of a congenital maldevelopment of the blood chemistry, for the reason that while it is perfectly conceivable that a healthy child may receive a fatal dose of infection during or soon after birth, it is hardly to be imagined that a baby with a congenital blood disease of whatever nature could develop *in utero* to perfect maturity and yet within a few days develop a disease which in spite of all treatment progresses rapidly to a fatal issue.

To say that the complement is lacking or that thrombokinase or prethrombin is at fault is not to express a true etiology, since as has been said it is not conceivable that a child can develop *in utero* to perfection, it being as dependent for its health upon its blood before birth as in after life, and yet within a few hours or days after the inception of extrauterine existence, and without any cause operating *de novo*, show such a calamitous pathological outbreak as the condition under discussion. On the other hand, if it be granted (it is admitted freely that it is not as yet proven) that septic infection is the fundamental pathological factor, the changes in the blood chemistry may by analogy be explained on the basis of the operability of various toxins.

Believing as I do that the blood changes, chemical and otherwise, are the results of a primary sepsis in at least a large proportion of these cases, it is natural that the avenue and source of this infection should be considered. As to the avenue of the infection it does not seem to the writer that it is justifiable to lay the blame upon the cord with the frequency usual to those considering this subject. Any one who is accustomed to inspect the stump of the umbilical cord and the ulcer left after its fall, will realize how general are the conditions in perfectly healthy babies, upon which some investigators have laid stress, as being the evidence of a pathological change. In other words, there is constantly moisture, some peripheral redness, and if very strict cleanliness has not been observed in the care of the child, quite a little odor. Moreover, if one will realize, first, how difficult it always is to infect granulating tissue, second that after a ligature has been applied infection through the exposed end of the cord is impossible, and third that the children usually die before the cord has had time to fall, it will at least seem reasonable to demand stronger proof of cord infection than has so far been produced, and to continue in the belief that the usual mode of entrance is by some other avenue. From the fact that in probably the large majority of these cases there is marked primary involvement of the gastrointestinal tract, and moreover that this tract is the one avenue through which infection may enter with the greatest ease, it has been for years the belief of the writer that this tract offered the usual way of approach, and in accordance with this belief

he has in so far as it has been possible to him excluded the so-called mouth cleansing after birth from his hospital services and private work, since he has been convinced that far more chance is given for the introduction of organisms by this attempt than for their removal, even if they are there to be removed.

One other point is felt of sufficient importance to be mentioned, namely, that while in older times these infections were more common in maternity hospitals, as a matter of fact the writer has seen several cases in private work, while they have almost disappeared from his hospital services. It may be that the introduction of the steam sterilized baby bath-tub, together with the greater care in handling young infants, has decreased markedly the incidence of the condition in hospitals. Several cases reported in a previous communication occurred in an institution in which no such care was possible, the needful facilities being lacking. It is to be remembered, however, that the dangers incident to the first few days of life in a hospital nursery are absent in private practice, in so far as they are dependent upon the transference of infection from one child to another, and yet these cases occur to-day in private work. This being so, it would seem to the writer that the evidence bears out the belief previously expressed that it is an infection by the mouth, and further that such infection occurs in the maternal birth canal. It is a matter of common knowledge that the lower part of the genital tract is rich in organismal life, and further that the head often remains stationary in the lower vagina for a considerable time. Moreover, in a certain percentage of cases, through interference with the placental circulation, the infant attempts to inspire while the head is still in the vagina; this is evidenced by the sudden imperfect extension of the head in the absence of a pain and is quite frequently noticed. It is the opinion of the writer in view of these facts that prophylaxis of many of these cases is impossible except in so far as prompt delivery may serve.

The recovery of the case now to be reported, the said recovery being undoubtedly due to injections of blood serum, has greatly impressed me. The details of the case are as follows:

Baby M. C. M. was delivered at full term. The parents were both healthy. The labor was normal and progressed rather rapidly until the head of the child was in sight on the perineum. Slight delay occurred at this point, but the retardation was in no sense unusual, and we were confidently awaiting spontaneous delivery when suddenly there was a copious discharge of meconium alongside the child's head. This was believed to be due to the interference with fetal circulation caused by the increased frequency of the uterine pains, which, as has been noted, had been for a time unavailing. Forceps were accordingly applied at once, and the child was rapidly extracted in a moderate asphyxia and fairly plastered with meconium. The convalescence of the mother was uneventful throughout. The child, a particularly fat and strong baby, did well until the fourth day, except that it had a slight elevation of temperature, it being over 101° all the third day and reaching 102° on the morning of the fourth. The stools also continued dark, but at this period they were simply meconium. On the morning of the fourth day a papulosquamous eruption was noticed on the chin. The characteristics of this rash may be appreciated by the fact that the nurse believed it to be due to irritation, but careful inspection based on previous experience did not enable me to take this comforting view. Aside from this, and the fact that there was the before-mentioned temperature, a symptom not unusual in new-born babies, there was nothing to cause foreboding at this time except that the child did not look as well as it had done previously; but I left her feeling far from comfortable, and was not at all surprised to be called back within an hour because of bleeding from the cord. Inspection showed that the blood came not from the mummified distal end of the cord but from its periphery, just external to the

abdominal insertion. Adrenalin and pressure having failed, a ligature was passed by needle through the cord just within the abdominal wall, which checked the bleeding entirely. The diagnosis was established, however, to my mind, and corroboration was furnished by the occurrence of vaginal and some rectal bleeding later on the same day. Slight traces of blood in the vomitus and a hematoma under the left lateroposterior neck muscles followed within the next two days. The emaciation progressed even more rapidly, it seemed to me, than is usual in these cases, and was associated with decided cervical retraction and restlessness. The child also seemed hyperesthetic all over its body, crying whenever it was touched, its tongue was dry, and its general appearance caused the most grave apprehension.

As a forlorn hope, in fact without any real belief that any good would result, I determined to try the injection of normal human blood serum. I had read the articles which appeared some two years ago by Dr. Welch, and with the most unbounded skepticism I made arrangements with Dr. Dorrance to procure a specimen. In passing I would like to remark, in order to emphasize the wonderful change that subsequently occurred in this child, that when Dr. Dorrance first saw her, on the occasion of the first injection, he felt that it was most foolish to interfere with what to both of us seemed to be her manifest destiny. In the emergency we were compelled to use the father as the donor for the first injection. A little more than 20 Cc. was injected into the tissue of the back. The next day 18 Cc. was injected in the morning and 10 Cc. at night. On the next day there was vaginal bleeding, but only 6 Cc. was injected, as our supply was temporarily low. The following day the cord separated in a perfectly normal manner; there had been no bleeding externally during the night, but the neck was discolored and swollen. Two doses were given on this day, the morning measuring 18 Cc. and the evening 14 Cc. Upon this same day a small swelling, which we believed to be a cephalhematoma, made its appearance. The next day the first normal stool was passed. The baby was evidently improving, and but 6 Cc. of serum was administered. A supply was kept in readiness for a couple of days, but was not used, as the child was free from any sign of active bleeding and the hematoma was decreasing in size. The weight was also increasing, and the temperature remained normal. I have had the pleasure of seeing this child within the past two weeks, and she is a large, healthy girl, presenting no evidence of the severe illness just recorded.

There is one point which I think would be well to emphasize in passing, namely, that as soon as the child showed symptoms of the diseased condition it was immediately placed upon artificial feeding. This I consider the proper thing to do in all cases of severe illness within the first few days of life, not only for the reason that the maternal supply at this period is so scanty, but also because I believe that injurious maternal milk is not as rare a commodity as some seem to believe.

The method of giving the injections is simplicity itself. Before considering it in detail I would mention that it has a distinct advantage over actual transfusion, which has been suggested and performed by some to meet the same indications, for two reasons: first, that the latter requires special skill for its performance, it being a delicate operation even in the adult and requiring a few special appliances; and secondly, that while there is never any difficulty to obtain donors of serum, on the other hand, thanks to the untiring efforts of the ever-present newspaper reporter, the public looks rather askance at requests for donors in actual blood transfusion. In the case just reported this difference was made very evident by the increase in the choice of donors which was afforded us after they were assured that they would simply have to submit to an old-fashioned bloodletting.

One word as to the method employed. Dr. Welch removes the blood from the vein by aspiration, and this procedure, while requiring a little training and a small amount of special apparatus, is without doubt bet-

ter than that used by us in this instance. Being unprepared and face to face with a distinct emergency, we simply incised the skin after careful cleansing, and collecting the blood by gravity we allowed the serum to separate spontaneously from the clot. With an ordinary antitoxin syringe the injection was made into the back of the child at a point anywhere from its scapulæ to its buttocks.

Small ¼-liter flasks were found to give relatively the largest amount of serum, and by using this size it is not necessary to place them in an inclined position while the serum is separating.

From my experience with the overwhelming mortality of this condition under expectant or any rational plan of treatment, the outcome of this case impressed me at the time as verging on the miraculous. I have no doubt that a fatal result was averted by the injections of normal human serum, and I am led to hope that in this very simple therapeutic measure, which is always ready to the hand of even the isolated practitioner, we may find ourselves in possession of an agent which will be found potent for good in combating diseased conditions before which we have in times past confessed defeat.

NORMAL HUMAN BLOOD-SERUM INJECTIONS IN MELENA NEONATORUM AND OTHER CONDITIONS.

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Approximately eighteen years of trial to which the serum of the horse, immunized artificially against the toxin of diphtheria, has been subjected has put it in the rank of a specific in the treatment of diphtheria. The principle of artificial immunization operative in connection with this serum has been adopted in other instances, so that now we have other antitoxic sera, more or less efficient, developed against several organisms. In the meantime, during the growth of knowledge concerning the curative properties of the serum of animals artificially immunized, it has been learned that normal sera possess under certain circumstances a decided therapeutic value.

Those experienced in the use of the various sera are well aware that their advantages are not unalloyed. Associated with the brilliant successes attending their use are numerous tragedies, begotten of their untoward effects. These effects are very commonly encountered when the serum of an animal is used in a different species, but fortunately are rarely severe enough to produce death, and they do not occur when the serum of the same species is used. This latter observation I made in 1902, in using normal human blood serum after having had a disagreeable experience with the use of diphtheria antitoxin.

A young man, twenty years of age, ill with pulmonary tuberculosis, was admitted to the New York City Hospital. After a fair trial of the then recognized methods of treatment, I suggested to the attending physician that we withdraw a quantity of blood from some person convalescing from a surgical condition, which had not in any way affected the quality of the blood, allow it to clot, and with the separated serum inject our tuberculous patient, having in mind the possibility of furnishing some disease-resisting substance which had prevented the donor from contracting tuberculosis. The proposition seemed impracticable at the time, and a substitution was made. It was decided to use normal horse serum instead. This also was not procurable, but a substitute was furnished by Dr. William H. Park, in the form of a low-grade diphtheria antitoxin, having a strength of 150 units. It was reasoned at the time that the antitoxic properties of the serum, which was elaborated specifically against the diphtheria toxin, would also neutralize the toxins of other infectious diseases, a view then quite commonly held.

Following directions, I began subcutaneous injections of the weak antitoxin. Ten cubic centimeters were given three times per day. At the end of twenty-four hours there was a notable change in our patient, but not for the better. He complained of severe headache and excruciating pains in the joints, especially in the knees. The temperature, which had been quite constantly about 102°, rose to above 104°, the respirations increased, and there appeared over the entire body the worst itching, burning, urticarial rash I have ever seen. A few more injections were given, and with each the symptoms grew worse, making it necessary at the end of the second day to discontinue the treatment. The injections made our patient worse than he had been—in fact, he never regained the loss induced by the antitoxic serum injections.

Shortly after this experience I succeeded in getting from some of my patients a small amount of normal human blood serum, and made subcutaneous injections in pneumonia, typhoid fever, erysipelas, and diabetes. The disagreeable experience I had had with the diphtheria antitoxin injections made me overcautious, so that I used of the normal human serum at each dose from one to three cubic centimeters. I made no distinction between the alien and homologous serum. My experience with the larger doses of low-grade antitoxin made me fear untoward symptoms from the human serum, therefore the very small doses were used. Boldness begotten of uniform absence of symptoms following single and repeated injections of small doses of normal human blood serum has led to an increase in the size of the dose. From time to time the amount has been increased, until I am now ready to state that normal human serum in doses of three hundred cubic centimeters, administered subcutaneously, or repeated in smaller amounts over a period of nine months, to the amount of thirty-five hundred cubic centimeters, will not cause any of the symptoms so often produced by single or repeated injections of a foreign serum.

Since the beginning of the use of antitoxin the untoward symptoms have been occasionally fatal and are so frequently met with that they have instilled a fear into many of the profession and the laity. These symptoms appearing after single or repeated injections of alien serum are now known respectively as "serum sickness" and "anaphylaxis." The literature descriptive of the research on this subject is so voluminous as to render a review impossible. Probably every research laboratory in existence has in the past directed, or is at present directing, efforts toward discovering the nature of the sensitizing body, or is endeavoring to discover some substance which will neutralize the sensitizing body. In a recent volume of "Ergebnisse der Allgemeinen Pathologie," which reviews this literature to 1910, four hundred and twenty-two contributions are referred to which deal with this subject.

From all of this study of anaphylaxis have come some very important observations. Those perhaps of most importance, and which should be very seriously considered when the giving of alien serum is proposed as a therapeutic agent, are three in number.

Biedl, Kraus, Arthus, and others have demonstrated that a marked fall in blood-pressure accompanies anaphylactic shock. These authors have also demonstrated that the coagulation time of the blood is considerably lengthened in this condition. The third and most important change brought about is a decrease in the quantity of complement in the blood, which has been proven by Michaelis, Fleischman, Friedmann, Friedeberger, Hartoch, Scott, and others.

Nutritional experiments, dealing with injections of alien serum into guinea-pigs, have proven that it causes either a retarding of growth or death of these animals. Reviewing, then, in a few words, the effect of subcutaneous injections of alien serum, we have the following:

First, serum sickness with its fever, disturbing urticaria, joint pains, dyspnea, albu-

minuria, hematuria, and occasionally sudden death.

Second, it reduces blood-pressure.

Third, it decreases the coagulability of the blood.

Fourth, it causes a reduction in the amount of complement.

Fifth, it interferes with nutrition.

Subcutaneous injections of homologous serum do not produce the above conditions. In my own experience with the use of normal human serum I have never met with any untoward effects.

For the sake of comparing the nutritional effect of homologous with alien serum, an experimental study with normal human blood serum was made. The subject of the trial was a premature infant, born at about the eighth month of gestation. He took nourishment by mouth badly and steadily declined in weight from two thousand and twenty-five grammes, the weight at birth, August 17, to sixteen hundred and twenty-five grammes, September 5, a loss of four hundred grammes in nineteen days. On September 5 injections of normal human serum were begun and were continued through twenty-one days, to September 26. The baby's food remaining the same as previously, the weight began immediately to increase, and, suffering slight fluctuations, gained steadily for fifteen days to twenty-two hundred grammes, a gain of five hundred and seventy-five grammes. It then receded during the next six days to twenty-one hundred and twenty-five grammes, which was one hundred grammes more than the weight at birth. During this period the child received daily subcutaneous injections of normal human serum, in amounts varying from twenty to seventy-eight cubic centimeters, receiving a total of eight hundred and ninety-six cubic centimeters in twenty-one days. At this time the child was taken away in good condition and able to nurse well.

Of other conditions in which I have had experience in the use of normal human blood serum the various bleeding conditions rank first, and of these, more especially the hemorrhages of the new-born. Experience to date which I have had with thirty-two of these cases now warrants a few conclusions.

The infrequency of this disease and the rapidity with which it proves fatal make it extremely desirable that we have a well-known specific, easily obtainable, with which to combat it. The beginning of this condition is not always in the same way. The baby may be in every way apparently healthy, plump, rosy, and functionating normally. Without warning it may vomit a quantity of fresh blood or pass bloody or tarry stools, and these may be the only manifestations of hemorrhage. The bleeding may be subcutaneous, of a petechial nature, or occur as hematomata. The umbilical stump, a divided prepuce, or the gums may be the sites of hemorrhage. Fatal internal hemorrhages not infrequently occur without external manifestation and may affect the brain or any of the thoracic or abdominal organs. These cases clinically may show icterus, or may simply grow pale, feeble, and die without apparent adequate cause. The autopsy makes the diagnosis, and we find the hemorrhages usually within the serous cavities or beneath a serous membrane, such as the pulmonary pleura, in the pericardium, under the capsule of the liver, under the kidney capsule, or in the peritoneal cavity. Microscopic examination of the various organs at autopsy shows anemia and cloudy swelling of the epithelium of the parenchymatous organs. The epithelium of the gastrointestinal tract usually shows the most advanced changes of degeneration and desquamation.

Drawing a conclusion from experience with thirty-two cases of hemorrhagic conditions, treated by normal human blood serum, I am convinced that this agent is a specific for this pathological condition. For a partial detailed report on thirteen of these cases I refer you to the June, 1910, issue of the *American Journal of the Medical Sciences*. Time does not permit a review of the cases not reported, but I will review briefly a few of them; others would be but a repetition.

B. Z., male child, delivered at 9 P. M., October 19. At 9 P.M., October 20, vomited blood; at 11 and 12 P.M. bloody passages. October 21, bloody passages at 3 A.M. and 4 P.M.; October 22, bloody passages at 4 P.M.; October 23, bloody passages at 11 A.M. and 4 P.M.; October 24, three passages free from blood.

Normal human blood serum was injected as follows: October 21, 24 hours after bleeding began, 112 Cc.; October 22, 54 Cc.; October 23, 19 Cc.; October 24, 12 Cc.; October 25, 10 Cc.

When born this child did not have the plump, rounded contours of a normal baby, but appeared poorly nourished. The stools were from the beginning very foul-smelling. The first temperature, taken twenty-four hours after birth, was 100⅘°. On the next day it rose to 103°, and fluctuated between 100° and 103° for a few days, when it returned to normal. When the serum injections were begun the child was too weak to nurse and cried but feebly. Within twenty-four hours after the first injection he was able to nurse his mother, cry more vigorously, and made a steady gain to a normal condition.

N. J. L., born June 10; second child; negative family history; first child stillborn on account of difficult labor. Present labor lasted two and one-half hours; breech presentation; no interference; no anesthesia; weight at birth 5 pounds 12 ounces. Child appeared normal, and cried lustily; no cyanosis. On the third day it was slightly jaundiced. At this time it was noted he had a peculiar cry, there were spasmodic muscular movements, and he stopped nursing. There was no vomiting; the stools became yellow and were normal. Physical examination showed a small child with skin wrinkled, cyanotic and dusky. He was aroused with difficulty, occasionally giving a loud, shrill cry when disturbed. The fontanels were noticed to be tense and bulging. The pupils were slightly unequal, and the eyes were turned to one side at intervals. There was rigidity of the neck and extremities at intervals. There was twitching of the muscles of the face, arms, and legs. The knee-jerks were exaggerated. He would not take the breast, but would occasionally swallow fluid administered with a dropper. There were no evidences of hemorrhages into the skin or elsewhere. Lumbar puncture showed increased pressure, and one-half ounce of bright-red fluid was withdrawn, which contained 5,100,000 red cells, 2400 leucocytes, and 90 per cent hemoglobin. The specimen appeared to be pure blood and would not coagulate. The bulging of the fontanels disappeared at the time of the puncture, but returned fifteen minutes later. Sixty hours after the onset of the first symptoms treatment by normal human blood serum was begun. During this time the condition of the child became progressively worse, so that during the last twenty-four hours he could not be aroused at all, ceased to swallow, and the lack of nourishment and loss of fluid gave him the atrophic appearance of athrepsia.

He was not weighed on account of his poor condition. At this time 30 Cc. of serum was given subcutaneously; six hours later 30 Cc. more. After the second dose the child began to show improvement. He appeared brighter and was able to nurse, and the muscular twitching was less marked. Sixty cubic centimeters more serum was given in this twenty-four hours, at the end of which time the twitching had ceased entirely and he was nursing regularly every two hours. At the end of the second twenty-four hours the fontanels were still bulging and another lumbar puncture was done, drawing off one-half ounce of blood-tinged spinal fluid, showing that active hemorrhage had ceased. Serum administration was continued for five days, the amount being diminished each day. In seven days this baby received a total of six hundred and thirty cubic centimeters administered in twenty-three doses. Improvement was continuous. At the fourth week he had regained his original birth weight. At two months he weighed 8 pounds 8 ounces; at three months 12 pounds; at four months 15 pounds. At

four months he appeared to be a normal child, having no spasticity; he held his head up, was able to hold objects in his hands, smiled upon provocation, and did not show signs of mental insufficiency. To-day he is a normal baby one year and six months old.

B. A., the third child, a male, five and one-half years old, had always been very healthy until the present trouble. One afternoon he received a slight blow on the abdomen from the handle of his bicycle. Following this there was a very large hemorrhage under the skin. A few days later he fell ill with tonsillitis, which lasted four or five days. While convalescing from this attack he had frequent hemorrhages from the nose and some oozing from the gums. About ten days later, on July 10, the epistaxis was very marked; the child vomited a large quantity of blood and passed large bloody stools. The epistaxis and bleeding from the gums continued throughout the 11th. On the morning of July 12 a large quantity of blood was again vomited and many bloody stools passed. On the morning of the 13th again vomiting of blood and bloody stools. At this time I was called to see the child and found him very pale, tossing about the bed with air hunger, and so pale the lips were of a color indistinguishable from that of the skin surface. The temperature at this time was 103°, pulse 140, respiration 48. Between 12 o'clock noon and 12 o'clock midnight the child received 240 Cc. of normal human blood serum. July 14 there was a very slight hemorrhage from the nose, and some disintegrated blood passed in the stools. After this there was no more bleeding. The serum injections were continued, however, for five days, at the end of which time a total of 1034 Cc. had been administered hypodermically. After this the child made a slow but steady recovery to its normal condition.

L. M., male child, aged ten years. His mother was subject to severe and almost uncontrollable hemorrhages. Patient himself in the past had been subject to prolonged and almost uncontrollable hemorrhages from slight wounds. He was admitted to the Fordham Hospital after having fallen and punctured two wounds in the anterior part of the tongue with his teeth. On admission the tongue was swollen and black, and was bleeding steadily from two small puncture wounds near the tip. For the first twenty-four hours he was given calcium lactate gr. 10 q. 4 h., and adrenalin solution to the tongue on cotton in the form of a wet dressing. Bleeding was continuous. Peroxide of hydrogen was applied locally as a wet dressing; bleeding continued. Next day vomited a large clot of blood. Compresses of gelatin solution were applied locally and changed every hour through the night; bleeding continued. Treatment with gelatin, adrenalin, peroxide, and gr. 10 calcium lactate q. 4 h. was continued for four days without the slightest effect. On the fifth day a local dressing of fresh beef serum was made and changed frequently without the slightest effect. On the sixth day one ounce of normal human blood serum was injected subcutaneously. The hemorrhage stopped within four hours after the serum injection and did not return again. The boy was discharged on the fourteenth day very anemic, but with no tendency to hemorrhages.

I. J. G., whom I saw in consultation with Dr. Dowd, was a young man twenty-nine years of age. His family and personal history were negative. It was noted by his family and friends that he was always very pale but perfectly well nourished and healthy. Without warning his nose began to bleed and could not be stopped. After he had bled about a pint, according to the family estimate, Dr. Dowd was called. The nose was packed very tightly from both front and back, but without effect, as the blood lampwicked through the packing and continued to drip. The packing was removed several times and replaced tighter each time, but still without effect. The hemorrhage reduced his hemoglobin to 65 per cent and red blood cells to 2,000,000. On the fourth day I began injections of normal human blood serum, and within

thirty-six hours the bleeding had stopped and did not return.

The underlying condition in these bleeding cases I believe has to do with the endothelium lining the blood-vessels, and I think a disturbance in the balance of the ferments of these cells is the immediate cause of the hemorrhages. This disturbance I believe to be due to malnutrition. The malnutrition may be caused in different ways, but in the end has the same result. In the bleeding babies we find marked putrefaction, hypersecretion of mucus, and malodors indicative of marked decomposition in the colon. This decomposition is accompanied by the production of toxins, which are absorbed and interfere with the nutrition of the endothelium, possibly by producing a cloudy swelling, and thereby upset the balance normally maintained between the ferments and antiferments of these cells. In a very recent case of hemorrhage in the new-born a foul odor, identical with that of the stool, was exhaled from the general skin surface. Hemorrhages so commonly reported in specific babies can be accounted for in this way, and also those occurring in individuals having a bacteremia. The toxins of these various conditions are equally capable of destroying the normal equilibrium of the endothelium.

A long list of observations have descended to us from the literature which seem to have well established that these hemorrhages are due to some abnormal condition of the blood itself, that it is a blood disease. The main facts in support of this conclusion are the delayed coagulation time of the blood and what appears to be a hereditary tendency. In an article entitled "The Relation of the Blood Platelets to Hemorrhagic Disease," Dr. W. W. Duke has pointed out that there is a marked diminution of the blood plates in these hemorrhagic conditions, and that when these are supplied by transfusion of blood the bleeding stops for a time, but with the reduction of these elements again the hemorrhages will recur. The blood plates have been demonstrated to be the nuclei about which thrombi form, as they produce a ferment substance which is concerned in the formation of fibrin. Such thrombi we find, of course, as hemostatic agents, instrumental in stopping hemorrhage due to blood-vessel injury.

The blood of some of the bleeding cases has a normal coagulation time, but the greater number have the coagulation time prolonged, and in some instances decomposition takes place without clotting having occurred.

When normal serum, from whatever source, is added to the blood of any of these cases which have a much prolonged coagulation time, it will cause a prompt clotting. From this fact it has been reasoned that there is lacking in the blood of these individuals a kinase, or activating substance which would normally cause coagulation. If this were true we should expect to find a coagulation of the blood in the hemorrhagic areas in those cases in which the hemorrhages have been controlled by the use of serum, but this is not the case. Clotting in the tissues does not occur after the use of normal human blood serum. The hemorrhage is stopped through some other process than that of coagulation, and the blood of existing hemorrhages is absorbed without having formed clots. The effect of normal human blood serum in controlling these hemorrhages seems to be through its nutritional effect, especially upon the endothelium lining the blood-vessels.

These hemorrhages usually occur after some special disturbance of nutrition. This disturbance may be more or less chronic, with considerable wasting away of the general tissues before the hemorrhage begins. In other cases it seems to be more acute and a condition of toxemia or septicemia. In the first instance it appears to be a species of autointoxication, originating in the excessive growth of pathogenic bacteria in the intestinal tract with the absorption of large quantities of toxins; in the second instance a septicemia, with a growth of bacteria in the blood stream which produces a profound systemic poisoning. All of these

conditions have the same general effect upon the nutrition of the endothelial lining of the blood-vessels. This disturbance operates to upset the balance normally maintained between the ferments and antiferments native in the cells, thereby producing conditions leading to hemorrhage. The normal human serum is a prepared food having molecules with receptors which fit the receptors of the cells of the endothelium, according to the side-chain theory of Ehrlich, which in that way is capable of being incorporated into the cell body as nourishment without any energy being wasted in the process of digestion. The nutrition being thus easily restored, the balance of ferments is reëstablished and the hemorrhages stopped.

In septic conditions normal human blood serum appears to have considerable value. I have injected four individuals having bacteremia, from the blood of whom the streptococcus was obtained by culture. Two of these individuals recovered and two died. Two cases of very grave peritonitis have also received these injections. The first, a postoperative case, on which a panhysterectomy had been done, showed marked signs of acute peritonitis on the day following the operation. Beside high fever, rapid pulse, marked abdominal tenderness and distention, she had from the second day uncontrollable vomiting. She was unable to take any nourishment whatever and was rapidly sinking. Injections of normal human blood serum in doses of 5 to 7 ounces were given daily. After the second dose was administered she showed decided improvement, in that the vomiting ceased, she was able to take liquid by mouth, the temperature receded, and the abdominal condition quickly cleared up.

The second case, a girl nineteen years old, curetted after abortion, ran a high temperature between 103° and 104°, with rapid pulse, shallow rapid respirations, distended tender abdomen, flushed cheeks, and dry mouth. This girl was considered to be in a hopeless condition when injections of human serum were begun. Over a period of five days the serum was administered to the amount of three hundred cubic centimeters. The serum caused a decided improvement, and the patient returned slowly to her normal health.

The injections of human serum I have made in meningitis caused by the staphylococcus, streptococcus, and pneumococcus have proven of no value, possibly because these cases have been so far advanced in the degenerative processes caused in the parenchymatous organs by the bacterial toxins that recovery was impossible, though the bacteria may have been killed or their toxin neutralized.

There is a possible explanation for the beneficial action of normal human serum in septic conditions. Lack of resistance on the part of the individual to organisms may be due to one or two factors. The individual may have the ability to produce sufficient antibody, but have a deficiency in the complement content of his serum. Again, he may have sufficient complement but lack the ability to form antibody. In the first instance the complement would be supplied by the normal serum injections; in the second no benefit would be derived because the normal antibody in any given serum is a negligible quantity. The second class should be benefited by the administration of an appropriate antiserum, produced specifically against the infecting organism. I believe we are approaching methods by which we can fairly accurately determine which element is lacking in the blood of septic persons, and it will not be in the very distant future when we shall be able to direct much more intelligent treatment in any given case.

Injections of normal human serum have proven of value in controlling hemorrhage which occurs after operation on deeply jaundiced persons. In coöperation with Dr. Willy Meyer I have made injections in such conditions with good results. Dr. Meyer has reported this work in the *Journal of Surgery, Gynecology and Obstetrics* for August, 1911.

In passing, just a word in regard to the

injection of defibrinated blood which is advocated by some who have used it. Experiments made by Ehrlich have demonstrated that the red blood cells injected into the same species call forth a hemolytic body for their digestion and removal, which he calls isolysin. In the formation of the isolysins a certain amount of cellular energy is consumed in their production which is just so much extra tax on the individual's capacity for general resistance. The serum is so easily obtained that I can see no reason for using whole blood, especially in babies, thereby possibly reducing the strength of the child, already at its lowest ebb.

Transfusion, which has been so much employed, is of value, but it is accompanied by certain dangers. Hemolysis, thrombosis, and embolism, all or any of which may lead to the death of the patient, are to be feared. It is true that these are not very frequent occurrences, but still they are common enough to make one hesitate before using transfusion if some other efficacious remedy can be employed. The disadvantages of transfusion are, first, the difficulty of the operation, which is not so simple as many suppose; secondly, it is frequently necessary to use the method several times on the same subject, and in this it has certainly a great disadvantage, while on the other hand normal human blood serum can be repeated frequently and used indefinitely. I do not wish to disparage too much the use of transfusion, for I believe it has a field which no other agent or measure can replace. In cases of very marked depletion from prolonged hemorrhage in which the cellular elements of the blood are greatly diminished, I believe the only measure to use is transfusion, for in this operation we supply the cells necessary to the blood which are entirely lacking in any serum we may administer.

INJURIES OF THE SHOULDER AND THEIR RELATION TO SOME CONDITIONS OF THE UPPER EXTREMITY OF OBSCURE ORIGIN (STIFF AND PAINFUL SHOULDERS, TRAUMATIC BRACHIAL PARALYSES, BRACHIAL BIRTH PALSIES, OCCUPATION PALSIES, RECURRENT AND OLD UNREDUCED DISLOCATIONS OF THE SHOULDER).[1]

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My time will not permit more than a brief summary here of deductions reached from work previously done and already reported. Of the conditions with which this paper is concerned, it may be said that the pathogenesis is particularly obscure in every instance, although there has been much discussion concerning them and many different theories have been offered. In addition to being obscure it may be also said that they all involve more or less the whole upper extremity, are always associated with some degree of palsy, in the early stages give pain which may persist for long periods, and almost always exhibit limitation of abduction and external rotation at the shoulder-joint. It is my belief that they are all closely related to each other etiologically, and that we are dealing not so much with a variety of distinct pathological conditions as with different expressions of essentially the same pathological lesion.

Underlying the obscurity, in my opinion, is a failure to appreciate some important facts concerning the anatomy of the shoulder-joint and their relation to the most common accident in this region, forced abduction of the arm. I believe that it is to the shoulder what the forced dorsal flexure from a fall on the hand is to the wrist, and what the forced lateral twist of the foot is to the ankle. The most common accidents to the body are those resulting from falls on the hand. Man walking upright is in

[1]Read before the Pennsylvania State Medical Society, at Harrisburgh, September, 1911.

constant danger of falling, and when he does so he employs his hands or hand to break the force of the fall—*i.e.*, he sacrifices the less important extremities in favor of the more important head and trunk which contain the vital organs. I believe that when falling, if conscious, he reflexly and frequently unconsciously throws out the limb with the elbow in rigid extension and the palm facing the object against which he strikes; that he practically never strikes first on his shoulder or elbow. I believe also that when we appreciate the importance of this fact we shall begin to understand more clearly than we do now the mechanism of injuries to the shoulder and elbow. There is no question concerning the relation of the fall on the hand to fracture and sprains at the wrist, which are among the most common in the body. In connection with fractures and dislocations at the elbow it is very likely that we attach too much importance to falls on the elbow. But we are concerned now only with the shoulder, and although there are other common accidents which produce forced abduction at the shoulder, the fall on the hand is the most common and may, therefore, be used as a good example.

The shoulder-joint is one of the most vulnerable in the body, as shown by the frequency of dislocations here. When a force applied to a bone is sufficiently severe the result is a fracture; when to a joint the result is a tearing of the ligaments with or without a dislocation. In the latter case, whether there occurs a dislocation or merely a sprain (after the reduction of the dislocation), the joint lesion is the same except as to degree. It is generally recognized that forced abduction is the great cause of anterior dislocations of the shoulder and that almost all are anterior. But we have not recognized abduction as at all peculiar to injuries of the shoulder other than dislocations. The most common cause of forced abduction at the shoulder is the fall on the hand, the upper extremity being at such an angle with the ground at the moment of impact that it is carried away from the body. If the angle with the ground is such that the arm is carried toward the body, the patient strikes immediately afterward on the arm and perhaps on the shoulder. Whatever injury he sustains from such an accident, it will in all probability not be a dislocation or a sprain, because the trunk will prevent adduction beyond the physiological limit of the joint. When abduction is forced, however, there is nothing to resist it except muscles and ligaments, and when the normal limit is passed the capsular ligament always gives way on the axillary side of the joint. The ease with which the capsule is torn can be readily demonstrated on the cadaver. I have gone fully into this phase of the subject elsewhere, and I wish here merely to call attention to this capsule lesion, its mechanism, and the frequency with which it occurs. In my opinion, it is the underlying cause of the conditions with which this paper deals. The forced abduction may be due to getting off a street-car, throwing a baseball, grasping the limb of a tree in falling, pulling on the arm of a child during delivery, and many other such accidents. One fact stands out prominently in connection with these conditions: they are more commonly associated with dislocations of the shoulder than with any other definitely established traumatic condition. Those cases in which there is no history of a dislocation are associated with the same tear of the axillary portion of the capsule from forced abduction. Either there was a dislocation that was spontaneously reduced as the arm fell to the side of the body immediately after the fall, or the tear of the capsule was not extensive enough to permit the escape of the humeral head from the socket. Here then is a lesion which even in dislocations has received little attention, and in the other cases has not been considered.

The obscurity as to the cause is to be explained by several circumstances. In the first place is the failure to appreciate the frequency and the effect of forced abduction at the shoulder. Immediately after the forced abduction the arm falls by gravity to the side of the body, and when the patient recovers from the excitement of the

moment and finds his arm at his side, he too frequently concludes that it was in this position when he fell and that he struck on his shoulder. The seat of the lesion is deep in the axilla and further concealed by the fact that the patient persists in keeping the arm at his side because abduction causes severe pain. The pain, tenderness, and swelling soon become diffused, so that localization of the lesion by the clinical signs becomes difficult or impossible.

In the early stages there will be found severe pain on attempts at abduction and external rotation, because these movements more than any other drag on the torn portion of capsule and the surrounding inflamed tissues. Adduction and internal rotation relax them, so that we find the patient constantly favoring this, the position of rest. His physician does the same when he slings the wrist from the neck. As time goes on and the inflammatory process subsides, cicatricial contraction takes place and the limitation of abduction and external rotation tends to become permanent, except in so far as the patient stretches the contracted tissues by forcing the limited movements. The degree of this chronic limitation will depend upon the extent of the original laceration, the severity of the inflammation which it caused, the efforts which have been made to stretch the contracted tissues, and the stage at which the forced movements were begun. It may persist throughout life, but even in the oldest cases it can be overcome. Under a general anesthetic the contracted capsule can be torn, the arm forced into full abduction and maintained in this position by a splint and bandages, but preferably with a plaster cast, for several weeks. The arm may then be allowed to come down to the side of the body, after which suitable exercises and massage will be in order to preserve the motion thus obtained and to improve the atrophied muscles. I have done this repeatedly with excellent results in every case. If begun early enough the forced movements and massage will be sufficient without tearing the capsule under an anesthetic.

The pain in these cases will vary according to the extent of the lesion, the stage at which the case is observed, and the degree of involvement of the nerves by the inflammation in the axilla. In the early stages it is diffused about the whole shoulder, but later is frequently referred to definite points in the shoulder region, in the arm more particularly at the insertion of the deltoid, and not infrequently is referred to the forearm and hand. It would seem that the nerves most involved in the adhesions are responsible for the character of the referred pain.

The pain and limitation of movement have been accounted for by several writers, more particularly Codman, by the existence of an inflammation in the subacromial bursa, the condition becoming chronic on the development of adhesions between the bursal surfaces. Codman[1] offers no explanation for the associated loss of power in the muscles of the arm, although he says that "in some cases these secondary changes in the nerves and muscles almost amount to a real paralysis and simulate lesions of the brachial plexus or progressive muscular atrophy." When I was preparing my first paper[2] on this subject I could find nothing in the literature that combated the bursitis theory, of which Codman was the chief exponent. In trying to establish the capsule theory it became necessary to combat the prevailing one, and my efforts were directed chiefly against Codman's evidence. Indeed, I believe that I am safe in saying that the only evidence upon which the bursitis theory can be justified is that of Codman. It is of such a character that it must be reckoned with. He has very recently published a paper[3] of considerable length which is given up entirely to the answering of my criticisms of his support of the bursitis theory, and this he does with admirable fairness. He thinks that the capsule theory will explain some of the cases, but that most of them are due to an inflammation in the subacromial bursa. He says that some one else may later show that both of us are wrong. I believe that I am prepared to

[1] *Boston Medical and Surgical Journal*, 1906..
[2] *American Journal of the Medical Sciences*, April, 1911.
[3] *Boston Medical and Surgical Journal*, August, 1911.

sustain convincingly the theory which I am offering, but must leave that to another time. My chief objection to the bursitis theory is that it allows too much to remain unanswered.

More troublesome than the pain, because more permanent and disabling, is the more or less severe palsy of the limb which is always associated. It tends toward very slow improvement, frequently lasts several years, and may be permanent. The most generally accepted view at the present time is that these paralyses are the result of injuries to the brachial plexus or its roots. It was at first thought, in connection with those following dislocations of the shoulder, that the paralysis was due to an injury of branches of the plexus in the axilla, by the humeral head; but this theory was abandoned because the muscles affected were too widely distributed to be accounted for by an injury to a few nerves. I believe that it is due to the involvement of some or all of the branches of the plexus in the axillary inflammation which follows the laceration of the capsule. The torn blood and lymph vessels and the joint fluid escaping through the rent in the capsule infiltrate extensively the loose axillary tissues, surrounding and invading the nerves themselves. The early impairment of the function of the nerves by the neuritis and pressure of the surrounding inflamed tissues and the later involvement by adhesions and cicatricial contraction seem obvious. Improvement in the movements of the shoulder will be associated with a gradual disappearance of the paralysis. Except in one particular type I have never seen it fail, and I have seen about thirty cases. In connection with dislocations, the best collection of autopsy cases showing the condition of the nerves in the axilla that I have found is that of Delbet and Cauchoix.[1] They showed that the nerves were not so much injured as enveloped in an area of inflammatory or cicatricial tissue, such as would follow the laceration of the axillary portion of the shoulder capsule.

I would group these cases under the traumatic brachial paralyses of adults, because they are usually found in adults, who have attributed them to injuries of the shoulder region. In doing so, however, I have in mind only those cases in which the palsy is severe. They are among the cases which Codman ascribes to subacromial bursitis. According to my experience these paralyses fall into two distinct groups—those in which the humeral head is maintained at its normal level under the acromion, and those in which the muscles and ligaments are relaxed and the humeral head falls an appreciable distance below the acromion. The tips of the fingers can be pressed into a hollow between the acromion and humeral head, which can be raised easily to its normal level by pressure under the elbow, but falls again when this support is removed. I have found no attempt in the literature to differentiate as to cause between these cases, although the distinction is, in my opinion, exceedingly important. They have all been ascribed to injuries of the brachial plexus, but why the paralysis is associated with relaxation of the shoulder-joint in the few and not in the many has never been explained, so far as my investigations have gone. The distinction as to prognosis is of the greatest importance. Those cases in which the joint relations are normal tend toward recovery, those in which the joint is flail do not. The movements and power of the hand and forearm may improve, but about the shoulder the condition gradually grows worse. I have seen one case in a young man, twenty-one years of age, who had his injury when one year old. The atrophy was so marked that the upper end of the humerus was almost subcutaneous. I have had two cases upon which I operated, one five weeks and the other eight weeks after the accident, the operation being based upon the theory as to cause which I shall offer, with practically complete recovery of motion and power in both.

In my opinion these flaccid shoulder-joints are not due to paralysis from injuries to the brachial plexus, but to anterior dislocations of the shoulder in which not only the axillary portion of the capsule is torn,

[1] *Revue de Chirurgie*, 1910, xxx, 673.

but the usually untorn upper and posterior portion also gives way. The external rotator muscles overlying this portion of the capsule and having their insertion into the greater tuberosity may be torn also or the tuberosity may be detached, but the tearing of this upper and posterior portion of the capsule alone may be responsible for the condition. This loss of support allows the whole extremity to fall away from the glenoid cavity from a half to three-quarters of an inch, with an abnormal tension on the nerves sufficient to account for the paralysis. It is likely that the blood-vessels and the muscles suffer also from the tension. The operation which I did was merely to restore the normal joint relations by shortening the upper and posterior portion of the capsule in one case and the capsule and overlying external rotator muscles in another. I have shortened the capsule alone in two other cases recently, and they are making satisfactory progress up to the present time. I believe that my two recoveries are the only two on record, and that they alone prove the theory. The progress made by the two more recent cases corroborates it. I have offered other evidence, but cannot repeat it now.[1]

It has long been recognized that the brachial birth palsies are of the same type as those occurring in adults from injuries of the shoulder, and here again the generally accepted theory is that they are due to injuries of the brachial plexus at delivery. My knowledge of these cases is obtained from observations on three cases and a study of the literature. I believe that like the adult cases they are due to injuries of the shoulder-joint, not of the brachial plexus, but I shall not attempt to discuss the question here. I have found the typical limitation of abduction and external rotation, and believe that it is always present in the early stages, although it may disappear later. The paralysis is much more severe in children, probably because of the immature condition of the nerves and muscles and of the lessened tendency of the child to force the limited movements. I find also that the only known traumatic condition with which these cases are associated is the dislocation of the shoulder, and this association is frequent. Essentially the same kind of palsy is associated with congenital dislocations of the shoulder. I find also that these obstetrical palsies consist of the same two groups of cases as in the adult—those in which the joint relations are normal and those with flaccid shoulder-joints. Moreover, as in the adult, the flaccid joint type is relatively much less common than the other. The important point here is that if the cause is the same in both, then the flaccid joints, or paralytic dislocation of the shoulder developing at birth, can be cured by restoring the normal joint relations just as the adult cases were cured. Thus far I have not operated on such a case. No harm is to be expected from merely restoring the normal joint relations, and I am hopeful that much can be accomplished by it.

What appears to me to be the same condition as occurs in the flaccid joint type of obstetrical palsy is credited to anterior poliomyelitis, and I have raised the question as to whether the latter cases may not be due to an overlooked trauma of the shoulder-joint like the others. This suggestion is so radical that some reasons should be offered for it. My investigations have seemed to show that in these cases the paralysis is always confined to the extremity in which the flaccid shoulder-joint is located. If poliomyelitis causes it, then the cases ought to be common in which other parts of the body are also paralyzed. I have reported two of Dr. J. W. McConnell's cases, in which the muscles about the shoulder were paralyzed more extensively than in the flaccid joint cases ascribed to poliomyelitis, as well as muscles in the other extremities. Yet in these two there was decidedly no relaxation of the shoulder-joint, and the humeral heads were held up snugly at their normal levels under the acromion. I have found several text-book illustrations of similar cases, which seemed to show that there was no relaxation of the shoulder-joint in

[1] *Journal of Nervous and Mental Diseases*, April, 1911, p. 193.

them. Of 2500 cases collected from the New York epidemic of poliomyelitis in 1907, although the symptomatology was particularly detailed, there was no mention of a flail shoulder-joint or paralytic dislocation in connection with any. When a cadaver is maintained in the upright position with the arms hanging at the side, while occasionally there is a slight drop of the humeral head, but not nearly as much as in these cases of paralytic dislocations, in most bodies that I examined the humeral head was held up snugly under the acromion. If paralysis alone were the cause of the relaxation, it ought to be marked in the dead body. I have mentioned these facts merely to justify the raising of the question as to whether there is not some other factor than paralysis to account for the falling of the humerus. If poliomyelitis alone can cause it, there will be no necessity for entertaining my suggestion long, since the opportunities for disproving it are abundant. On the other hand, the operation of fixing the humeral head at its normal level is not at all serious, and if it accomplishes nothing else it will at least place the joint surfaces in their normal relations to each other, so that any unparalyzed muscle fibers may act to better advantage. The loss of balance in the actions of the surrounding muscles from the displacement in a flaccid joint is probably a serious factor in disturbing their functions. If the operation were followed by a disappearance of the paralysis as in my adult cases, then it would be proven that the case operated on was not due to poliomyelitis. I have operated on one such case, but twelve weeks later it was found that the relaxation had partially recurred. In the meantime the paralysis had so improved as to satisfy my mind that it was not a case of poliomyelitis, although this diagnosis had been made by a well-known neurologist. At the end of twelve weeks I operated a second time. The healing was perfect after both operations, but after the second the patient developed pneumonia and died. This may, however, follow any operation. It should be stated here that no theory has ever been offered which satisfactorily explains those cases, except that based upon a supposed poliomyelitis.

I feel justified in suggesting that many of the so-called occupation palsies, like writer's palsy, may be due to overlooked capsule tears at the shoulder. There exists now considerable evidence to show that they are frequently traumatic in origin. It has also been shown that they are frequently associated with considerable pain about the shoulder and arm. If it could be shown that in the early stages they exhibit limitation of abduction and external rotation at the shoulder, pain about the shoulder and arm, in addition to the palsy which suggested the diagnosis, the condition could in my opinion be fairly attributed to a laceration of the capsule of the shoulder-joint. I have reported a case in which, following an accident, there was pain about the shoulder, and down the arm and forearm to the hand, marked weakness of the muscles (the most noticeable sign of which was the dropping from the hand, unconsciously, of such objects as a drinking-glass), tenderness in the axilla, and ten weeks after the accident the characteristic limitation of abduction and external rotation. The patient was a graduate nurse, and her chief complaint was that she could no longer perform massage movements, upon which her livelihood depended. Although she had had much experience with similar conditions at the shoulder, she had not suspected a causal relationship between the shoulder condition and the disabling palsy in the hand and forearm. Schulz reported the late results in a large series of uncomplicated dislocations of the shoulder, in which long after the dislocation and reduction the weakness in the hand and forearm was frequently of such a character that the patient could not follow his usual occupation. The disturbances in the hand are so serious that they distract attention from the shoulder-joint condition (in the absence of a dislocation), so that the causative relationship is frequently overlooked. I would advise that in occupation palsies with a traumatic origin the shoulder be examined for limitation of abduction and external rotation.

In recurrent dislocations of the shoulder,[1] before the margins of the rent in the capsule produced by the original dislocation had healed with sufficient firmness, the arm was carried too far into abduction and the humeral head brought to bear too strongly against this portion of capsule, now too weak to retain the head in the glenoid cavity. As a result the dislocation again takes place, the margins of the rent are once more forced apart, and the plastic reparative material is stretched between them. The efforts at repair having been partially spent they cannot now reunite the margins as firmly as if they had been undisturbed. After another short period the same accident recurs, again the margins of the rent are forced apart, so that finally the healing process is completed with a new cicatricial portion of capsule bridging the gap between the separated margins of the rent. In a normal joint when abduction takes place the axillary portion of the capsule tightens up and restrains the humeral head from leaving the glenoid cavity. With a lengthened capsule this support is lost and more or less frequent recurrences result. If this portion of capsule is exposed and properly shortened as by overlapping, the dislocations will not recur. I have operated on eleven cases. In one the dislocations recurred and became more frequent than before the operation. A second operation, done since the reading of this paper, showed that the recurrences were now subluxations, due to the presence in the humeral head of a large defect. However, the occurrence of violent epileptic convulsions soon after the operation, and before the repaired capsule had properly healed, was probably chiefly responsible for the recurrence of the condition. In another case, from violent abduction on one occasion and external rotation on another, there occurred a slight subluxation with immediate reduction. But this patient swims a great deal, chins himself easily on the horizontal bar, and uses his arm freely in many ways without fear or further trouble. The operation was performed twenty-one months ago, and the last subluxation was more than a year ago, so that the case should be regarded as a success.

In both of these patients an effort was made to shorten the capsule to just within the normal, in order to shorten the convalescence. The immediate effect of the operation is to produce the conditions that follow every dislocation of the shoulder properly treated. It is essentially the same condition which Codman ascribes to subacromial bursitis, and which I have ascribed to a laceration of the axillary portion of the shoulder capsule. The healing of the capsule tear with the arm in adduction and internal rotation, the sling position, must tend to fix it there. But if vigorous movements are begun after about four weeks, before the cicatricial tissue becomes too unyielding, and are kept up long enough, full motion and power will return and all pain disappear. This has been my experience after the operation for recurrent dislocations. If immediately after the reduction of the original traumatic dislocation the patient forces the arm rapidly into full abduction and external rotation, he will frequently escape the troubles of a stiff and painful shoulder, but this is the most fruitful cause of recurrent dislocations.

We are all familiar with the great difficulties in the reduction of old unreduced dislocations of the shoulder, and the growing tendency to operate on them early. Unfortunately direct exposure of the joint has not helped greatly in accomplishing the reduction, so that in many instances the operation has been concluded without reduction, and by many surgeons excision of the humeral head is regarded as the best procedure. We have never succeeded in establishing the particular anatomical obstacle to reduction. It has been my opinion for some time that it is associated with the changes going on about the humeral head at the site of the rent in the capsule. It is my purpose to report more fully in the near future concerning my experience with this condition. With this theory as a working basis, I have had considerable suc-

[1] *American Journal of the Medical Sciences*, February and March, 1909, and *Journal of the American Medical Association*, March 12, 1910.

cess with the old method of reduction by traction on the abducted arm and fixation of the scapula. The old rule was not to attempt reduction after three months. The present tendency is to operate much earlier. I have performed reduction in one case after four months, in another after eight months in which an effort made at three months had failed, and in a third after eight weeks in which there was a fracture of the lower third of the humerus. I attempted one after four years, but failed. I believe that I failed in this case not because of the time which had elapsed since the accident, but because there was lodged in the glenoid cavity something which had fallen into the socket and had become adherent there, after the head had been displaced. I am confident that I repeatedly brought the head into the socket, and that in most cases there will be no such obstacle, and if the head is placed in the glenoid cavity and the arm brought to the side of the body, the head will stay in the socket.

THE FACTORS CONCERNED IN THE PROCESS OF THE CLOTTING OF BLOOD.

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The great number of investigations that have appeared during the last fifty years upon the subject of the coagulation of blood have given us numerous interesting and important facts, numerous theories, and a confusing nomenclature, but there is no doubt that the process in its entirety is far from being completely understood at the present time. One may justly claim perhaps that it has been demonstrated that the last stage in the process consists in a reaction between fibrinogen and thrombin, and that as a result of this reaction fibrin is formed and deposited. The main difficulty that confronts us is to explain the origin of the thrombin. It is admitted quite generally that the thrombin exists in the circulating blood in an inactive form, designated usually as prothrombin, and that the initial stages in coagulation consist in the processes which convert this inactive prothrombin to active thrombin. From the many studies upon this point it has become evident that two equally important factors are concerned in this activation. In the first place calcium is required. If the calcium contained in the blood is precipitated, for example, by the addition of oxalate solutions, the prothrombin remains in its inactive form and the blood does not clot. While this fact is simple and clear we have no accurate knowledge of how the calcium acts in normal clotting. It is, however, a most significant and suggestive fact that the reagents which precipitate or fix the calcium of the blood-plasma at the same time preserve the blood-plates from disintegrating, and it would seem that there must be some causal connection in shed blood between the presence of the ionized calcium and the breaking up of the platelets.

The second factor concerned in the activation of the prothrombin is the presence of a substance of unknown nature which is found in most if not all of the tissue cells, including the cellular elements of the blood. This substance has been designated by various names, such as zymoplastic substance, thromboplastic substance, etc. At first it was supposed simply to facilitate the process of activation of prothrombin, but it may now be said that this substance is essential to the process.

In the lower vertebrates—birds, reptiles, fishes—it is known that the blood withdrawn carefully from the vessels so as not to come into contact with the tissues, and then centrifugalized promptly to remove its own corpuscles, yields a plasma which either clots with great slowness or does not clot at all. When such animals are wounded the blood flows out over the tissues, and under these conditions it clots firmly in a few minutes. Even in the mammals, including man, blood removed carefully from the vessels by means of a clean cannula or

syringe clots much more slowly than blood that comes into contact with the wounded tissues. We are in fact justified in saying that unless the blood receives some of this thromboplastic substance either from its own corpuscles (plates, especially) or from the external tissues it will not clot under ordinary conditions. The way in which these two fatcors coöperate in activating the prothrombin is explained quite satisfactorily by a hypothesis first clearly stated by Morawitz. According to this hypothesis the thromboplastic substance is an organic activator or kinase (thrombokinase). In combination with the calcium it activates the prothrombin, but neither factor alone is sufficient to effect this change in the prothrombin. In the circulating blood, according to this theory, there are present fibrinogen, prothrombin, and calcium, but the kinase is lacking and is furnished after shedding either by the disintegration of the blood-plates (mammals) or by the external tissues (vertebrates below the mammals), or by both. On account of its simplicity and logical completeness this theory has been accepted quite generally, but as the result of investigations that I have been making I am obliged to dissent from it. The theory is unsatisfactory in two points: first, it does not take sufficient account of the presence of an antithrombin in the blood, and secondly, no adequate experimental proof has been furnished to show that the substance yielded by the tissues really acts as a kinase or organic activator to the prothrombin. I wish to present an alternative theory which seems to me to be better supported by experimental evidence, and which if correct, or if more nearly correct than the hypothesis of Morawitz, will make a decided difference in our investigations of the causal conditions in the hemorrhagic diseases.

This alternative theory rests upon two facts: First, the presence in the circulating blood of a constant amount of antithrombin; secondly, the proof that this antithrombin is antagonized or neutralized by the thromboplastic substance (thromboplastin) found in tissue extracts. By antithrombin we mean a substance which acts as an antibody to thrombin. In some way, probably by combining with the thrombin, it prevents the latter from reacting with fibrinogen to form fibrin.

An antithrombin has been isolated in pure form, or approximately pure form, from the salivary glands of the leech, and is for sale under the name of hirudin. It is a soluble protein of comparatively simple composition, resembling the peptones and proteoses. A similar substance has been shown to exist in blood-plasma. I have been able to obtain undoubted evidence of this latter fact by a simple procedure. By a method which I have described elsewhere I have been able to isolate thrombin in a pure or approximately pure form. If a solution of this pure thrombin is added to a solution of pure fibrinogen a typical clot will form in a few minutes. If to such a mixture one adds a little hirudin the process of clotting is delayed or is prevented altogether, according to the amount of hirudin used. Instead of hirudin one may employ blood-plasmas and obtain a similar result. The procedure is as follows:

The blood to be examined is caught in a one-per-cent solution of sodium oxalate solution. The blood thus rendered incoagulable is centrifugalized and the clear plasma is pipetted off. The plasma is then heated in a water-bath to 60° C. to precipitate its fibrinogen (and prothrombin) and is filtered. After cooling one adds one or more drops of this plasma to a given solution of thrombin, allows the mixture to stand for ten minutes, and then adds the fibrinogen. According to the quantities used the heated plasma retards or prevents entirely the action of the thrombin or the fibrinogen. If the plasma which is being tested for antithrombin is heated to about 85° and filtered it will be found that its restraining effect upon the thrombin is no longer exhibited. By comparative experiments of this kind it may be shown that the amount of antithrombin present in birds' blood-plasma is considerably greater than that in mammal-

ian plasma, and that the amount present in the blood-plasma of the lower mammals (dog, cat) is greater than that in human blood. In so-called peptonized dog's blood the amount of antithrombin present may be relatively enormous, and sufficient to neutralize large amounts of thrombin. If antithrombin is a constant constituent of blood one may assume that it plays an important rôle in maintaining the normal fluidity of this liquid. There is in fact considerable evidence that the body possesses means by which it maintains constantly a certain excess of this antithrombin, but an excess which is kept within a certain low limit. If, for example, one injects into the circulation a solution of pure thrombin or even a large amount of blood serum rich in thrombin there is no intravascular clotting, as one might have anticipated. On the contrary, so far as the thrombin solutions are concerned at least, the blood shows a delayed coagulation, for the reason that the excess of thrombin has stimulated the body (the liver) to secrete a corresponding excess of antithrombin. On the other hand, if one injects into the circulation a large excess of antithrombin, hirudin for instance, the blood may show a delayed coagulation for a short time, but soon the excess of antithrombin is destroyed or removed and the normal balance is restored. One may imagine in fact that some thrombin is being formed continually in the blood, but that it acts as a hormone to stimulate the liver to produce a corresponding excess of antithrombin, or possibly the prothrombin itself may have a similar action.

If we grant that the antithrombin does maintain or help to maintain the fluidity of the circulating blood, why is it, we may ask, that soon after the blood is shed this action disappears and clotting occurs? The answer to this question is to be found, I believe, in the action of the thromboplastic substance furnished by the tissues, including, it will be remembered, the material of this kind derived from the disintegrating platelets.

I have carried out a series of experiments, the details of which have been published in a recent number of the *American Journal of Physiology*, vol. xxix, p. 187, which seem to me to demonstrate clearly that the thromboplastic substance in tissues, or thromboplastin as we may designate it for convenience, neutralizes the effect of antithrombin. In these experiments mixtures were made of fibrinogen and thrombin, and enough antithrombin was added to retard or prevent coagulation. If to such a solution thromboplastin (tissue extracts) was added the effect of the antithrombin was neutralized and the clotting was made possible or the time necessary for the clotting was shortened. For example, to quote a short series, results of the following character were obtained in an experiment in which fibrinogen and thrombin constituted the coagulating solution, the antithrombin was a solution of hirudin of a concentration approximately of 1 to 40,000, and the thromboplastin (tissue extract) was a glycerin extract of thymus, diluted 1 to 3 with water:

THROMBOPLASTIN.

1. Fibrinogen, 0.5 Cc.
   Hirudin, 1 drop.
   Thromboplastin, 0.5 Cc.
   Thrombin, 5 drops.

Solution clotted in less than 1 hour.

2. Fibrinogen, 0.5 Cc.
   Hirudin, 2 drops.
   Thromboplastin, 0.5 Cc.
   Thrombin, 5 drops.

Solution clotted in 3 hours.

CONTROLS.

1. Fibrinogen, 0.5 Cc.
   Hirudin, 1 drop.
   Glycerin and water (1-3), 0.5 Cc.
   Thrombin, 5 drops.

Solution clotted in 2 hours 15 mins.

2. Fibrinogen, 0.5 Cc.
   Hirudin, 2 drops.
   Glycerin and water (1-3), 0.5 Cc.
   Thrombin, 5 drops.

Partial clot in solution after 6 hours, 30 mins.

In these experiments the accelerating influence upon coagulation caused by the thromboplastic extracts could not be explained on the hypothesis suggested by Morawitz, namely, that they acted as a kinase to assist the calcium in activating prothrombin. The thrombin was added in ac-

tive form and the solutions contained no calcium. There seems to be no way of explaining the action of the thromboplastin except by admitting that it neutralizes the antithrombin. If this conclusion is admitted then the whole kinase conception as advocated by Morawitz falls to the ground, and the well-known and important, indeed essential, influence of the tissue extracts in normal coagulation must be explained not on the supposition that they aid in the activation of the prothrombin, but on the view that they antagonize or neutralize the antithrombin. We may believe that circulating blood contains normally all the necessary factors for coagulation, namely, the fibrinogen, the prothrombin, and the calcium, but these factors are prevented from reacting—that is to say, the calcium is prevented from activating the prothrombin—by the presence of antithrombin, which is also a constant constituent of the circulating blood. When the blood is shed this antithrombin is neutralized by the thromboplastic substance furnished by the wounded tissues, in the case of the lower vertebrates, or by the wounded tissues and the disintegrating platelets in the case of the mammals.

This point of view emphasizes greatly the importance of the antithrombin in the blood and suggests the probability that variations in the time of coagulation may depend upon the greater or less amount of this substance in the blood. Influenced by this consideration the writer is making a systematic study of the relative amounts of antithrombin in normal blood under varying conditions and in the blood of the so-called hemorrhagic diseases. It seems most desirable that in these latter diseases all the fibrin factors should be studied in a quantitative way. This can be done without difficulty for the fibrinogen, the calcium, and, by the method that I am using, for the antithrombin. For the prothrombin, however, no available method has been devised. Perhaps all that we know about this particular factor is that it can be obtained from the blood-plates, and presumably therefore a marked loss of plates in the blood may be associated with a deficiency in this factor. Only by means of such studies will we be able to analyze successfully the causal factors concerned in the production of the various hemorrhagic conditions, so far as these causal factors are dependent upon changes in the blood itself.

THE SUPPLEMENTARY HOME TREATMENT OF SEPTIC WOUNDS IN DISPENSARY WORK.

BY S. W. MOORHEAD, M.D.,
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The dressing of wounds once in twenty-four to forty-eight hours or even longer is sufficiently often if they be aseptic, but in cases in which the wounds are infected, or in which incisions have been made to combat suppurative processes, dressings six times a week are too infrequent, and it becomes a problem in dispensary work, and to some extent in private practice as well, to secure dressings at sufficiently short intervals. In hospital practice dressings twice a day and on Sundays can be usually secured through coöperation of the internes, but the added work thus entailed soon becomes a burden, and is rarely performed with enjoyment.

To obviate these difficulties I last year adopted the practice of having the patients change the dressings on their wounds at home, with the most satisfactory results. Doubtless superior results would have been forthcoming could all of the dressings have been performed by a physician, but even imperfectly performed as they were by persons often of the lowest grade of intelligence the improvement over the results previously obtained was startling.

Before beginning the experiment I was a

little skeptical as to the measure of success that would be attained, being fearful that the imperfect asepsis that must necessarily attend the home dressings would in many cases serve to discount the good results accruing from the more frequent changes. This fear has been found to have been without foundation. In no case was a wound rendered worse as a result of the home treatment, and while in some the improvement was less rapid than in others, yet at no time were results sufficiently discouraging to cause me to even consider the advisability of abandoning the method of treatment.

In deciding whether a given case should be told to change his dressings at home, or whether the older plan of having all dressings done at the dispensary should be followed, two factors were considered—the character of the wound and the mentality of the patient. If the wound was of such a nature that it might reasonably be supposed that in the course of twenty-four hours—that is, before the time for the next dispensary—pus would collect in such quantities that it would be present under pressure so that an extension of the process would ensue, or if the infection was already making rapid progress, and if the mentality of the patient was such that he could be expected to remember and carry out the simple directions given him, the case was deemed suitable for home treatment.

The dressings which the patients were directed to apply were always of the simplest nature possible. Bichloride of mercury, phenol nor any of the various other antiseptics were ever prescribed. Peroxide of hydrogen was never advised. Instead plain boiled water, or normal saline solution, or a solution of sodium chloride and sodium citrate, were employed as being at once harmless and inexpensive. The last-named solution was the one oftenest used, and was found particularly beneficial when a considerable degree of cellulitis was present. The patients were supplied with a mixture of the two salts, four parts of sodium chloride and one part of sodium citrate, and were directed to dissolve two to three level teaspoonfuls in a glass of hot boiled water. This gave a solution of approximately four-per-cent sodium chloride and one-per-cent sodium citrate, such as has been recommended by Wright, the sodium chloride being of hypertonic strength, serving to cause a flow of serum from the tissues into the dressing, while the citrate prevented coagulation by precipitating the calcium salts. The exact strength of the solution seemed to make little difference; one patient mistook the directions and used a tablespoon instead of a teaspoon, and complained that the solution burned him so much that he was unable to keep his finger immersed for fifteen minutes as he had been instructed, but his sensory nerves were the only structures to suffer, the local condition being markedly improved.

Whenever the location of the wounds permitted, the patients were directed to place them directly in the solution, keeping the latter as hot as it could be borne, for ten to thirty minutes every three or four hours, removing as much of the pus before and after the treatment as could be done by very gentle pressure. After the soaking they were to dress the wounds with pieces of sterile gauze wet with the solution, the dressing being prepared prior to the bathing of the part. Small packages of sterile gauze and sterile gauze bandages were supplied by the hospital at cost.

It has been my desire in writing this article to illustrate to what a considerable extent it is possible to secure the coöperation of patients, even of those of the lowest class, in the care of their wounds. The advantages consist in a decrease in the amount of pain and a decrease in the destruction of tissue by virulent processes and in the time required for repair, and therefore a decrease in the number of return visits that it is necessary for these patients to make, with a consequent saving of the surgeon's time and of the hospital's surgical supplies. I have never known patients who were able to purchase the gauze, bandages, etc., required to complain of the

added expense of the treatment. Instead they have been uniformly grateful for the added interest shown, and for the added comfort experienced from the more frequent changing of the dressing.

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THE PRESENT POSITION OF SPINAL ANALGESIA.

In the *Birmingham Medical Review* of October 14, 1911, MCCARDIE tells us that from an extensive review of all the literature available to the author on the subject he concludes that spinal analgesia is retrogressing in favor, and is generally only used when there are marked contraindications to inhalation anesthesia, and local anesthesia is not possible. The exceptions are surgeons who have had a special experience of the method in a large number of cases of the same kind. In Germany the method is being abandoned by 50 per cent of the surgeons who have used it.

The proportion of deaths, as one would expect from the conditions, is greater than in inhalation anesthesia.

The immediate dangers are at least as great. The after-effects not uncommonly are most severe, affect the nervous system, and on the average at least are as frequent as those following inhalation anesthesia. Many of them are most persistent and disastrous, though the author asserts that the English results are much better in this respect than the foreign.

In spinal analgesia the chief after-effects are headache, backache, and raised temperature. In inhalation anesthesia, vomiting.

The percentage of failures in the former is very high. An excessive dose, whether absolute or relative, as in the case of idiosyncrasy, is more immediately and hopelessly fatal than is one after ether or chloroform, because it cannot be antagonized by mechanical and eliminative means.

The diffusion of liquid in the spinal canal is very different from the diffusion of vapor in the lungs.

In the treatment of emergencies from spinal analgesia one does wrong whether one sets up or inverts the patient; in the one case he may die of syncope, and in the other of poisoning.

Keen says that the ideal anesthesia will abolish pain by abolishing consciousness, but without danger to life. Spinal analgesia, states Zachrisson in a review of the subject, does not fulfil either of these conditions.

The author places analgesia, as a method of preventing pain, between inhalation and local anesthesia. Generally speaking, he thinks it should only be used in certain selected cases.

COMBATING EPIDEMIC DIPHTHERIA.

In the *Johns Hopkins Hospital Bulletin* for October, 1911, FORD describes how he fought diphtheria in that institution.

In buildings where the presence of animals or expensive apparatus likely to be injured by the vapor of formaldehyde prevented disinfection of the structure as a whole, the separate rooms were sealed up and fumigated by the Parke, Davis & Co. formanganate briquettes or by the Du Prey candles. These rooms were kept tightly closed for twenty-four hours, and then the floors and walls were washed with soap and water and with disinfectants.

No bacteriological tests were made to determine the efficiency of the fumigation. The necessity for rapid work precluded any satisfactory observations, and it was realized that no method of disinfection is perfect. It was decided to carry out as vigorously as possible those methods which are recognized to be of the greatest value and to trust to a wise Providence that the contagion would be destroyed. Afterwards, when more time was available, with Dr. Norton's help, a number of observations were made during the disinfection of Ward G. It was found that surface cultures or organisms like bacillus typhosus, bacillus coli, streptococcus pyogenes, and bacillus prodigiosus were killed when exposed to the gas generated by the Parke, Davis & Co. briquettes of formanganate. The organisms in the depths of the tubes remained viable, however.

EDITORIAL.

AURICULAR FIBRILLATION AND ITS TREATMENT.

From time to time in the past we have expressed the opinion that many practitioners administer digitalis in too large doses, and have advocated the use of smaller amounts than those commonly employed, since it not infrequently happens that we see cases in which great cardiac irregularity and distress has ensued from too marked a digitalis influence. We have long taught, however, that under certain circumstances the free administration of digitalis for a short time was not only advantageous but necessary. When this drug is employed to combat cardiac failure it may be used in large dose for its immediate effects when prompt relief is demanded, or it may be given in smaller, tonic doses with the idea of increasing cardiac tone and strength, and with every intention that the treatment will be continued over a number of weeks. In cases of valvular disease with ruptured compensation when the symptoms are urgent it is our practice to give digitalone hypodermically in the dose of 20 or 30 minims, and to follow this, at intervals of six or eight hours, by similar or smaller doses, according to the needs of the case. Rarely, however, is it necessary to use these large doses more than two or three times because smaller ones are adequate to maintain the effect the large ones have produced. When the manifestations of ruptured compensation are mild, the small doses may be used at first with equally good results.

During the last year or two considerable attention has been called to the condition which is known at the present time by the term "auricular fibrillation." Noteworthy contributions as to its significance and meaning have been made by Cushny, and particularly by James Mackenzie, to whom we owe most of our knowledge concerning it. It would seem probable that auricular fibrillation is identical with, or nearly related to, the condition previously referred to by Mackenzie as "nodal rhythm." However this may be, it has now been proved by Mackenzie, Cushny, and others that this interesting state develops in some cases of ruptured compensation with or without valvular disease, but most commonly in cases of mitral stenosis. It consists in a cessation of the normal auricular contractions, in place of which fibrillary movements develop which travel over the wall of the auricle, the movement closely resembling the shivering movements which are seen in one of the thigh muscles of a dog which is suffering from cold. In other instances, auricular fibrillation develops without a valvular lesion. In some patients, when once developed, it persists for the rest of life, but in still others, particularly when it arises as the result of cardiac strain, it may be but a temporary phenomenon. In all instances of auricular fibrillation it is probable that the functional ability of the heart is considerably impaired, although it must be admitted that the degree of impairment varies to an extraordinary degree in different patients. Sometimes its onset is marked by extraordinary circulatory disturbances and even by syncope and death. In others the condition seems to persist for years, and while the patient's activities may be curtailed, he does not become bedridden. Ordinarily the contraction impulse starts at the sino-auricular node, and passing down over the bundle of His ultimately causes contraction of the ventricle. In auricular fibrillation, in its fully developed form, this impulse does not develop, or at most never reaches the ventricle, the ventricular wall beginning to contract as the result of an impulse arising in the node which is situated at the auriculoventricular margin.

The diagnosis of auricular fibrillation can be only guessed at when the ordinary means of studying cardiac lesions are employed. To determine its presence with scientific accuracy it is necessary to employ a polygraph, by means of which a tracing can be obtained both from the apex of the heart,

or the radial pulse, or the carotid, and from the jugular vein as well. Under these circumstances it will be found that the jugular pulse is of the ventricular form, or it may actually show the fibrillary waves from which the auricle is suffering. An examination of the pulse by ordinary methods shows that its rhythm is very irregular and disorderly, the pauses between the beats changing constantly in their duration, and as Mackenzie has pointed out, two succeeding beats are rarely of the same strength, and the two succeeding pauses are rarely of the same length. Additional information may be gained by inspecting the pulsating jugular, provided care is taken that the impulse transmitted to the jugular by the carotid artery is not confused with true jugular pulsation. Mackenzie makes the additional point that if a presystolic mitral murmur is known to be present prior to the onset of fibrillation, it at once disappears when fibrillation ensues; whereas the diastolic murmur of mitral stenosis persists. Then, too, the patient sometimes has a sense of cardiac fluttering which he is unable to describe, but which is nevertheless so definite that he is sure of its existence.

In the majority of instances in which auricular fibrillation develops there is probably a certain amount of myocardial degeneration and the prognosis depends to a large extent upon its degree, since its presence requires increased labor on the part of the ventricle. This increased labor is met satisfactorily if the heart muscle is strong, and unsatisfactorily if it has become impaired. In the aged, therefore, the prognosis is usually more unfavorable than in those who are younger. On the other hand, it must not be forgotten that in many cases of mitral stenosis the pathological lesion in the valve extends to, or involves, the tissues at the base of the valve.

It is interesting and important to note in this connection that according to Mackenzie's observations, which we have been able to confirm by our own experience, much more can be accomplished by active therapeutic measures than one would suppose from what we have just said. In a large number of these patients functional activity of the ventricle is greatly improved by the use of large doses of digitalis, and the whole cardiac mechanism seems to be better even if the fibrillation persists. This seems to be particularly true in those instances in which the heart-beat, as represented by the ventricle, is too rapid, reaching from 120 to 140 per minute. In those instances in which the ventricular beat is abnormally slow, digitalis is of little value. In the patients who suffer from a rapid pulse large and repeated doses of digitalis accomplish the results that we seek. Usually 20 minims of the tincture three times a day are sufficient, the dose being cut down to 15 minims three times a day after the good effects have been primarily obtained. Mackenzie does not think that these large doses, even when continued a long time, are dangerous, but we believe that there are some patients in whom danger exists, and we would suggest that patients taking these large amounts for any length of time be not permitted to suddenly take the erect posture or to resort to active physical exercise.

In connection with Mackenzie's most recent contribution to the subject it is interesting to note that Gesell in the issue of November 1 of the *American Journal of Physiology*, as the result of an experimental study, emphasizes the following points:

Auricular contractions play an important rôle in determining ventricular output.

When the ventricles are beating independently of the auricles, nullification of auricular activity resulting from fibrillation causes a fall in arterial pressure amounting to 10 to 15 per cent.

An increased venous pressure results from auricular fibrillation, and compensates to a considerable extent for auricular failure.

The same high venous pressure will, when the auricles resume their function, produce relatively large ventricular outputs. The auricles then to be most effective should have a large amount of blood at their command.

By gradually shifting the time relations

of auricular systole with respect to ventricular contractions, arterial blood-pressure changes are obtained amounting to 55 per cent of the pressure that can be maintained by the filling action of venous pressure alone.

The auricular systole varies in effectiveness in producing ventricular output, depending upon the time it occurs in ventricular cycle.

Auricular systoles completed in approximately 0.008 to 0.02 of a second before ventricular systole is begun seem to have the greatest effect.

Auricular systoles partly stopped by ventricular systole have a positive effect upon the filling of the ventricles.

Auricular systoles occurring entirely within ventricular systole seem to have no filling effect whatever.

Auricular systoles occurring partly within the ventricular systole, and in ventricular diastole and diastasis, increase in effectiveness from *nil* to *maximus* as they approach the beginning of ventricular systole.

Everything that is done to improve our conception of cardiac physiology, pathology, and therapeutics must be studied with great interest because of its importance. The points to which we have called attention in this editorial emphasize the fact which we have reiterated again and again for many years, namely, that every case is a law unto itself and that no definite rule as to size of a given dose of a given drug can be laid down. Some cases require massive doses of digitalis fearlessly administered. Other cases will do well only with small doses, and the judgment and skill of the physician are the factors by which these important differences are to be decided.

THE THERAPEUTIC EFFECT OF ACONITE.

In olden times when we knew nothing of microörganisms as the cause of disease, it was commonly supposed that hyperemias and congestions were solely dependent upon disorder in those areas through which blood-vessels were freely distributed. Acting under this conception of inflammatory processes it was a common practice for physicians to administer cardiovascular sedatives in the early stages of acute hyperemias with the hope of drawing blood away from the congested area and of diminishing the amount of blood which was sent to it. It is almost inconceivable that the good results which physicians thought they recognized after this use of aconite and similar drugs could have been entirely imaginary, although it is probable that the manner in which they did good was misinterpreted. It is hardly necessary to point out that no one who clearly understood the principle upon which aconite was used under these circumstances could have thought of employing it after inflammation had existed so long that actual pathological changes in the vessels and adjoining tissues had occurred. There can be no doubt, however, that with much improved conceptions of the cause of disease the use of cardiovascular sedatives has very materially decreased, and aconite, which at one time was an exceedingly popular remedy, is not employed by many physicians from one year's end to another.

It has been thought for many years, both by pharmacologists and practical therapeutists, that the dominant effects of therapeutic doses of this drug are to slow the pulse and directly or indirectly lower blood-pressure. A multitude of experiments upon the lower animals performed at different times by a large number of observers certainly support this view. We think, too, that the average clinician who has used this drug, sufficiently frequently to be a capable judge of its influence, holds the opinion that its effect on man is similar to its effect upon the lower animals.

For many years our employment of drugs was purely empirical, and we had little conception of their true action. Then followed a period of active investigation in regard to their influence upon animals which threw much light upon the therapeutic uses of remedies which had been found by practical experience to be of value. Within a comparatively short time,

largely through the introduction of instruments of precision, the effects of remedies when administered to man have been studied and recorded with laboratory accuracy and with advantageous additions to our knowledge.

In this connection it is interesting to note that Frederick W. Price has within the past six months reported to the Therapeutic and Pharmacological Section of the Royal Society of Medicine of London the investigations which he has made upon the action of aconite upon the pulse-rate, his studies being confined to the observation of its influence in cases of cardiac disease. The results which he has obtained are directly contradictory to those which have been generally accepted as correct and which we have already stated in this note. As a result of observation upon a large number of patients, using aconitine to represent the drug, he concludes that it has no influence whatever in slowing the pulse, and although he does not appear to have made a very large number of investigations upon its other effects, he nevertheless seems to believe that the remedy is one which possesses little value.

While it may be true that aconite in cases of cardiac disease, particularly instances of ruptured compensation, fails to slow the pulse, we do not think that this is sufficient justification for the assertion that it never slows the pulse, since the conditions which are present under these circumstances are very different from those which are present when aconite has been employed for other reasons. Thus, it may be pointed out that the administration of digitalis when fever is present nearly always fails to slow the pulse, yet this fact in no way contradicts the even more generally accepted statement that digitalis is the most powerful drug that we possess to diminish pulse-rate under ordinary conditions. Aconite may not be able to slow the heart in the presence of dilatation and valvular disease, but may slow the heart in the presence of fever or nervous palpitation.

It is possible that aconite may not act to produce beneficial results in the way which has been generally received, but this does not prove that it does not produce good results when it is properly administered in suitable cases. That it is a valuable remedy in many cases of so-called "tobacco heart," in the overacting hearts of athletes, and in certain cases of tachycardia associated with neurotic symptoms, is, we think, undeniable. Dr. Price's research is, however, to be studied with interest not only because of his individual results, but because efforts to determine the influence of drugs by laboratory methods applied to human beings are comparatively few and should be more frequently resorted to.

INFUSION ANESTHESIA.

In the continual endeavor to discover methods of producing surgical anesthesia which will prove more satisfactory than the old-fashioned inhalation method, physicians and surgeons are continually carrying out experiments. Many years ago the production of surgical anesthesia by the injection of ether into the rectum was suggested, and within the last year or two has been resurrected only to be buried again. More recently still another proposition has been brought forward, the most enthusiastic supporter of it being a German surgeon, Kümmel, who reported at the Berlin Surgical Congress 90 patients treated in this manner. So, too, in the *British Medical Journal* of October 21, 1911, Rood has recorded his experience and presented some interesting facts. The method consists, as originally pointed out by Burchhardt, in employing an ordinary intravenous injection of normal salt solution containing ether in the proportion of 5 per cent. The salt solution is infused until the patient becomes surgically anesthetic, when the infusion is stopped, and renewed as soon as the patient shows signs of returning consciousness. This method has been especially recommended in operations about the head and face where there are well-known difficulties in the administration of the drug by inhalation. It is claimed by those who are advocating its employment that it is not

followed by dangerous complications. One of the difficulties, however, is that not infrequently a clot forms at the point of injection between the first and second or before subsequent infusions. Usually 1/6 of a grain of morphine and 1/100 grain of scopolamine is given an hour before the vein is opened, and the injection is not made until just before the surgeon is prepared to operate.

Rood concludes that the method has the following advantages, although he admits that hemoglobinuria has sometimes occurred after the operation. In 21 cases which he has collected he asserts that the condition of the patient was good at the end of the operation, although the operations varied in length from three-quarters to three and a half hours. Postanesthetic vomiting practically never occurred.

It is interesting to note in this connection that Rood is an enthusiastic advocate of the so-called drop method of administering ether, which has now been used in this country for a number of years, and we are glad to say has become almost universal. The cumbersome inhalation apparatus of our English cousins has at last shown itself disadvantageous. The profession in America is so firmly convinced of the wisdom of resorting to the drop method that statistics are not necessary to confirm them in their belief, but for the sake of his countrymen Rood shows that in about 8000 laparotomies performed by different German surgeons using the closed method with ether or chloroform, the lung complications were in the neighborhood of about 5 per cent; whereas, in about 1400 other laparotomies in which ether was given by the open method, the percentage of lung complications was only 0.56.

THE TREATMENT OF SEASICKNESS.

In a number of issues, during the months of November and December, Schepelmann, at one time ship surgeon on the North German Lloyd steamers, has contributed to the *Klinisch-Therapeutische Wochenschrift* an exhaustive article upon seasickness, covering its etiology, symptomatology, and treatment. This is one of the most exhaustive and complete summaries of the subject that we have seen. In discussing its treatment he deals not only with medicinal measures but with psychotherapy as well, and discusses a very large number of drugs which have been recommended by a host of physicians as being more or less specific, ranging from simple bitters and special bitters (as strychnine and quinine) to such homely remedies as peppermint water and its more active ingredient, menthol; the latter substance, in doses of half to one or two grains, seeming to have given relief in a considerable number of cases. Cocaine has also proved useful, as has also a few drops of chloroform placed upon sugar. He quotes Fawcitt and Wheeler as having obtained excellent results from chloretone, given in the dose of from 5 to 12 grains. Amongst the other remedies which have been employed with seeming benefit are the opiates and the bromides, but the difficulty with both of these drugs is that they are too depressant in their after-effects. Another remedy which seems to have given excellent results in some cases is chloral given to the point at which it produces drowsiness. For this purpose veronal also seems to be an excellent substance.

TREATMENT OF SEPTIC PERITONITIS.

Upon this topic, always of major interest to the surgeon, an extremely serviceable discussion was conducted before the British Medical Association (*British Medical Journal*, Oct. 28, 1911), the opening paper being contributed by Mr. Morison, who likens the shock and the rapid death which result from scalding a large area of the skin to the same results which may follow a corresponding diffuse injury resulting from the rupture of a gastric or intestinal ulcer.

Morison observes that the discovery of the germ which produces septic peritonitis in no way aids us in curing the patient. He holds that for surgical purposes the name

of the organisms present, or even the fact of their presence, is of little avail, for we now know that no mechanical means can get rid of them, and that the name of the variety is of little importance, since some patients with a streptococcal peritonitis recover, whilst others with a bacillus coli infection die. It is held that whatever germ is present the prognosis is always good if the heart is of good volume, not over 100, and is always bad if the extremities are cold, if there is cyanosis, and the pulse over 120. As to the sunken appearance of the face in septic peritonitis with the symptoms of shock, Morison holds that anything which seriously disturbs the balance between somatic and splanchnic circulation will produce such a symptom.

The first principle of treatment is the realization of the fact that the peritoneum has a capacity to deal with organisms and dirt to such effect that, if an overwhelming dose from the source of supply can be prevented, recovery will follow. The only method by which this can be certainly and successfully accomplished is surgical, and consequently the first question after the diagnosis has been made in a recent case concerns operation. As to the anesthetic Morison expresses his strong preference for chloroform until laryngeal reflex is abolished, followed by ether. The best abdominal incisions are the straight one in the middle line and an oblique one in the direction of the fibers of the external oblique muscle. Proper conservatism is expressed in regard to the advisability of flushing out the abdominal cavity, Morison reserving this for cases in which the operations have been done early and extravasation of intestinal contents occurs widely in the peritoneum. He regards a temporary suprapubic glass drainage-tube as useful in arresting or preventing general peritonitis by allowing of the washing out of gastric and other extravasations, the washing if possible being carried out during the repair of the focus of infection. The tube is removed at the completion of the operation.

The indications for more permanent drainage are the presence of infected matter or the possibility of leak from imperfect suture or damaged viscera.

For general septic peritonitis the drain should be pelvic, and pelvic only, and it should be emptied at the time of operation and kept empty afterward by a syringe pump.

Fowler's position is commended. When the patient is very ill an intravenous saline solution is given with a small dose of adrenalin; the total amount should rarely exceed two pints and should require at least fifteen minutes for its introduction. In the after-treatment proctolysis, as advocated by Murphy, is the most serviceable measure, supplemented where needful by stomach lavage. Morison's opinion as to the use of morphine is especially noteworthy. He states that the most emphatic condemnation of the use of morphine, backed up by a large amount of scientific evidence, has failed to convince him that the effects of pain and restlessness are not worse than the evil effects of this narcotic, and he does not grudge a single dose.

Concerning purgatives surprise is expressed as to the revolution which has occurred in reference to their use. There is no doubt that it was once a fashion that was abused in surgery, but the proper use of purgatives should not be forgotten.

In the class of cases with which all surgeons are familiar, namely, those with peritonitis incident to gangrenous appendicitis or ruptured gastric or duodenal ulcers, after the first attack of pain and fright have passed off these patients may look and seem comparatively well and protest against surgical procedures because of this. He regards such a condition as indicative of the fact that the peritoneal circulation is adequate to the strain thrown upon it. Therefore the intervention should be confined to the removing of the immediate cause. He states his belief to the effect that interference is often of doubtful benefit in cases of general septic peritonitis of more than three days' duration, from whatever cause it may have arisen. In the great majority of such instances the focus of infection has by this time been shut off,

and much harm can be done by a senseless and untimely operation. Two cases of perforating stomach ulcer are noted, both of which recovered under conservative treatment. They subsequently developed pelvic abscesses, which were evacuated by the rectum.

In acute pneumococcal and in gonococcic postoperative and puerperal peritonitis—at least in the stage when they usually come under surgical observation—operation is unlikely to do good and may do grievous harm. In other words, when there is no removable septic focus, early operation is not a satisfactory treatment.

Koch, in discussing this paper, expressed belief to the effect that all cases should be operated upon as soon as possible, only those cases which are brought moribund into the hospital being left alone. Even when seen in the later stages he believes that operation is indicated. In the worst cases general anesthesia is not to be used. By giving an injection of morphine and the use of local anesthetics section can readily be performed. Muscle splitting is not advised as a means of access since it is better to get cure with a hernia than to die with a beautifully conserved abdominal wall. When nothing is known about the cause midline incision is indicated. He advocates both sponging and washing out, and notes little difference in the results. In the last two years Koch has employed a suction appliance, a double tube which prevents the bowel from being sucked into the opening. Puncture of the bowel is employed where it is greatly distended. Fistulæ are not recommended. Appendicostomy is serviceable as a means of giving the patient water. The skin is never sutured, as Koch has at times seen gangrenous purulent phlegmons of the subcutaneous tissue follow this procedure. The persistent vomiting following operation is treated by continuous drainage of the stomach, a thin drain being introduced through the nose, as recommended by Westerman. This treatment is much more effective and less fatiguing than repeated washing out of the stomach.

An appendicostomy opening is regarded as a much better method of administering water than is continued proctolysis, which is apt to soil the bedclothes. In many cases intravenous and subcutaneous injections of physiological salt solution are made. In bad cases adrenalin is also employed. The sitting position is guardedly commended. It is stated that Kuester's ventral position has always been refused by the patient. In the after-treatment such medicaments as coffee, wine, strophanthus, camphor, and ether are advised.

Paterson calls attention to the fact that the Fowler position, the importance of rapidity in operating, and the method of continuous proctolysis, have all been the result of the teaching of American surgeons. The whole operative treatment of diffuse peritonitis is admirably summed up in Dr. Murphy's pithy remark: "Get in quick, and get out quicker." In bad cases he advises the use of cathartics, beginning with the use of calomel, as soon as the patient gets out of ether.

Andrew advises closing cases of peritonitis without drainage.

Wright advocates treatment of the patients at their own homes.

Childe attaches some importance to clothing the patient from head to foot in a cotton-wool jacket.

Bishop advises preliminary administration of morphine-scopolamine before anesthesia, and after it pituitary extract for the purpose of increasing peristalsis. With this opinion Bidwell coincides, giving 1 Cc. every four hours for the first three days. Bidwell also advocates the treatment of septic peritonitis by rectal drain—that is to say, an opening made from within, through the pouch of Douglas, by means of a pair of strong curved forceps into the rectum, and a tube passed through this opening, and then through the anus and stitched to the skin of that region. This permits closure of the suprapubic wound. The rectal tube he found was frequently removable in two or three days. It had been alleged that if the rectal drain were used it would be impossible to administer saline solution per rectum, but in his experience

there was no interference with the administration of saline solution by the rectum.

Wilkie calls attention to the immediate microscopic examination of the peritoneal exudate at operation. The presence of streptococci does not necessarily mean a bad prognosis, providing the cellular reaction is a vigorous one. The important point is the relative number of microörganisms free in the fluid to the number of phagocytic cells. If many of the bacteria are found free in the fluid the prognosis is, as a rule, grave. In order to favor peristalsis and free drainage, he advocates the pouring in of a few ounces of sterile vaselin oil; moreover, this delays the formation of plastic adhesions. In the after-treatment the passage of a continuous oxygen current through the drainage-tube in the pelvis is advocated. This in several cases was followed by marked betterment. In desperate cases an injection of blood serum drawn from the median basilic vein of another patient who has just recovered from an infection by the same bacterium is advocated. Sixty cubic centimeters of blood was withdrawn from the vein; the serum was allowed to separate, and then injected into a similar vein of the patient. Of seven cases thus treated two recovered.

This discussion is of particular interest, since it indicates that to an extent the treatment of acute peritonitis is becoming standardized. Immediate operation, swiftness and gentleness in dealing with the cause, and the Fowler position for proctolysis are practically accepted by all. A few still advocate calomel immediately following operation until the bowels are moved. Given in minute doses it is probable that this drug does no harm. It may even be serviceable by lessening intestinal fermentation, although this is doubtful. In any event the records do not seem to show that the bowels were open earlier than they would have been without this medication. The question of drainage still appears to be an unsettled one, and the vast majority of surgeons are distinctly in favor of its conservative use. Koch's commendation of continued stomach drainage by means of the nasal bougie is a matter for careful thought and certainly for clinical trial. It commends itself as helpful in cases both of distention and of persistent regurgitant vomiting. Before pituitary extract is accepted as a reliable peristaltic excitant there will have to be more evidence in its favor than has hitherto appeared.

In the discussion above outlined the view generally accepted was that pneumococcic peritonitis in its earliest stages is not benefited by operation; the data upon which such opinions were based have not been given. To one who has studied the statistical data dealing with the mortality of peritonitis in the past and at the present time, it is clear that the gratifying figures now obtaining are due to earlier recognition and prompter operation; secondly, to the general acceptance of the fact that the vast majority of these cases are due to the appendix and that thus no time is lost in the search for the focus; and finally to the general adoption of enteroclysis and the Fowler position in postoperative treatment.

REPORT OF THE SURGEON-GENERAL OF THE ARMY.

The reports of the medical service of the army and navy are always of major interest to the hygienist and the therapeutist because they represent an unemotional, unbiased, accurate statement of facts, from which the careful reader may deduce much of value. Thus in looking over the table of surgical operations performed by officers of the medical corps on officers and enlisted men of the army during the calendar year 1910, it is interesting to observe that upon 4175 cases chloroform was used 296 times, ether 1513 times, chloroform and ether 55 times, and local anesthesia 1793 times. Of the total number of cases 27 died.

As indicating the aptness of the medical officer to adapt himself to the fashion of the day it is noteworthy that there were 193 cases of tonsillectomy; 253 cases of appendectomy (with 16 deaths); 177 cases of inguinal hernia (without a mortality); 304 cases of operation for hemorrhoids, every

known method apparently having been adopted; forty-four cases of hydrocele by methods which varied greatly. Of 184 varicocele operations the high excision was the method of choice. Of 403 circumcisions, 310 were done under a local anesthetic and 22 under chloroform. A further tabulation study shows that 71,534 men of the army spent 938,210 sick days.

Alcoholism, acute bronchitis, gonorrhea, malaria, influenza, syphilis, and chancroid are the diseases which incapacitate the most men, gonorrhea standing by many thousand at the head of this list; chancroid and syphilis not greatly exceeding acute alcoholism. It is further interesting to note the distribution of these diseases in the various services. Thus, whilst the men of the Ordnance Department seem particularly subject to acute alcoholism, acute bronchitis, and influenza, their gonococcal and syphilitic ratio is markedly lower than that of any other arm of the service. The Field Artillery, with the lowest incidence of acute alcoholism, exhibits the highest of both gonorrhea and syphilis, the Cavalry coming next in rank. The Coast Artillery shows a large proportion of acute alcoholism and a comparatively small one of bronchitis and influenza, also a fair incidence of both gonorrhea and syphilis.

In regard to time incidence of venereal diseases, it is shown that the great majority of admissions occur in the month of January.

One of the most gratifying features of the report is the rapidly lessening importance of typhoid fever as a crippling factor. It is graphically shown by a chart and it is further stated that during the year 1910, 16,093 men were protected against typhoid fever by prophylactic vaccination. Of these, 73 per cent received three doses, 21 per cent two doses, and 5.7 per cent one dose. During the first six months of 1911, 27,720 persons were immunized; of these, 93 per cent received three doses, 6 per cent two doses, and 1 per cent one dose. The immediate effect of the vaccination is evidenced by the presence of a local reaction consisting of a red and tender area which subsides in the course of a day or two, and a general reaction consisting of malaise and sometimes fever. In no case has there been any untoward result, not even an abscess at the site of inoculation. General reactions in the last series were absent or mild in 99 per cent of the inoculated. During the last 2½ years there have been a few cases of mild typhoid occurring in the vaccinated—eleven in all to July, 1911. It is noted that positive Widal reaction has no significance in the immunized person, hence it is by no means certain that all the vaccinated cases listed as typhoid were actually such, the diagnosis in four of the eleven cases being doubtful. The evidence as to the protective value of the inoculations is regarded as convincing.

The most important innovation of the year is the introduction of compulsory immunization of troops ordered into active service in Texas and along the Mexican border, and of all recruits on joining the recruiting depots. In this way the immunization of all persons in the service will be completed in about three years' time.

As to venereal diseases it is held that the propaganda for their prevention initiated by the central office in January, 1909, has begun to show good results. There is a diminution of incidence, though this is not so marked as to be convincing. In addition to lectures and inspections, individual packets of disinfectants have been issued which are intended to be used as soon as convenient after exposure. The difficulty seems to be in persuading the men to use these packets, to use them in an efficient manner, and at the time when they are likely to be most serviceable. It is pointed out that recruits are much more prone to acquire venereal infections than trained soldiers, and that where the civil authorities exercise a supervision over prostitutes there is a marked lessening of the incidence of these infections.

Perhaps the most striking feature of the whole question is the indifference of enlisted men as to means of prevention. It is stated that they neither fear infection nor are they averse to spending a long period of

idleness in hospital while their duties are being performed by their comrades.

From the standpoint of prophylaxis as accomplished by preventive means after exposure, the army experience is by no means encouraging for those enthusiasts who advocate the general introduction of such measures into civil life.

REPORTS ON THERAPEUTIC PROGRESS.

LUMBAR PUNCTURE IN THE TREATMENT OF AURAL VERTIGO.

PUTNAM, in the *Boston Medical and Surgical Journal* of September 28, 1911, reminds us that it is now nine years since Dr. J. Babinski, of Paris, first called attention to the therapeutic value of the withdrawal of 10 to 20 cubic centimeters of cerebrospinal fluid as a means of treatment of certain forms of aural vertigo, his interest in the matter having become aroused in the course of his studies on the vertigo and nystagmus attending the action of the galvanic current upon the structures of the labyrinth.

Babinski's first communication on this subject was before the Société Médicale des Hôpitaux, on October 31, 1902, and since then he and others have published numerous papers relating directly or indirectly to the same topic. A full list of these articles is given in the graduation thesis of Edouard Molard, which sums up all the available information and adds a number of new cases. The whole number of cases thus far reported by Babinski and others runs up to several hundred.

The author's attention was first attracted to the matter five years ago, since when he has used this treatment in cases referred to him by Dr. C. J. Blake and several others of his own, with results which on the whole have been distinctly favorable.

It has been thought worth while to report these results because the use of this treatment, in spite of having been once or twice commented on in American publications, has by no means received the attention that is its due.

The considerations most worthy of attention are the following:

(1) It is to the disorders of the semicircular canals that aural vertigo is due, and it is by acting on this portion of the labyrinth that the galvanic current produces (in normal subjects) vertigo, nystagmus, and the inclination of the head toward the side of the positive pole.

(2) The functional efficiency of the apparatus of which these canals are an essential part may be impaired, even though the cochlea and auditory apparatus are in a normal state, so that tests for hearing are an insufficient guide in the determination of the labyrinthine condition in cases of aural vertigo. Much better guides are (*a*) the strength of galvanic current required for producing vertigo, nystagmus, and inclination of the head, and determination of the direction of this inclination; and (*b*) equilibration tests, such as those of Bárány.

The best cases for treatment by lumbar puncture are those in which these various tests show that the labyrinthine apparatus is still in a fairly normal state. When the neural degeneration is far advanced, the effects of withdrawal of cerebrospinal fluid are less marked at the outset, and repetitions of the operation, which in the better cases work well, produce less and less marked results and are eventually of no benefit.

The most favorable cases of all are those of pure labyrinthine origin and of relatively short duration. In such cases no great disturbance of hearing is present, and especially no serious middle-ear disease. It is also noteworthy that in cases of this class the sensitiveness of the labyrinthine apparatus to the galvanic current, which before the treatment by lumbar puncture may have been poor, as shown by the fact that it required a strong current (even 20 milliamperes or more) to cause the vertigo,

inclination, and nystagmus, even if it could be induced at all, after the puncture may become again more nearly like the normal. This change indicates a physiological improvement which may not be indicated by any corresponding change in the patient's feelings—*i.e.*, by any great modification of the vertiginous tendency.

The prognosis as regards results of treatment varies so much with the character of the cases that percentage becomes misleading. It may, however, be fairly said that the outlook is very good indeed for those cases in which galvanic and other tests indicate a labyrinthine vertigo with but little nerve degeneration, so much so that few patients fail to obtain benefit, although occasionally two or even three treatments, at intervals of two or three weeks, may be required for the best results.

The amount of fluid withdrawn in Babinski's first experience was 5 to 10 Cc.; later, the withdrawal of 15 to 20 Cc. was found to give better results. The relief from the vertigo sometimes occurred at once, sometimes only after the lapse of several days. In these latter cases (eighty), Babinski thinks, the fluid must have been resecreted by the time of the setting in of the improvement. In a fair proportion of the cases any tinnitus which had accompanied the vertigo, and even, though less often, the deafness, if this were present, were likewise more or less relieved. No untoward results were observed greater than headache, with or without nausea, of one to several days' or even one or two weeks' duration.

Five years ago the writer called the attention of Dr. C. J. Blake to these interesting statements and did a lumbar puncture on a patient for him. Since then he has used the same treatment in about twelve of Blake's cases and several of his own with results that have been equally satisfactory with those of Babinski. Among the most strikingly favorable cases he refers especially to those of two relatively young male adults, twenty-four and twenty-nine years old, respectively, both cultivated, and thus good observers of themselves. It is noteworthy that in both of these cases the headache and nausea consequent on the lumbar puncture were more severe and protracted than in any of the other instances. These symptoms kept the patients practically confined to bed for about two weeks, and alarm would have been felt for the results had not the temperature in both instances remained normal. It would naturally be thought that these two coincident results, headache and relief, implied the withdrawal of an unusual amount of fluid. But this is not the fact, and this inference is not justified.

ACUTE AILMENTS IN PERSONS ADDICTED TO THE USE OF NARCOTICS.

PETTEY writing in the *New York Medical Journal* of September 10, 1911, says that fortunately we have one drug in our armamentarium which has sufficient power to bring about free intestinal motion notwithstanding the restraining effects of the opiate, provided it is given in sufficient dose and at the proper time. That drug is strychnine. Ordinary medicinal doses, however, are not sufficient. In estimating the quantity of strychnine required in any given case, age, weight, and physique of the patient must be taken into consideration, as well as the quantity of morphine, the paralyzing effects of which we are seeking to overcome. Young persons are more susceptible to strychnine than older ones. The short, compactly built, in whom a fair degree of muscular tone is present, do not require as much as the tall, loose-jointed person with flabby, atonic tissues, but the relation between the time of giving the strychnine and the morphine, the effects of which we are seeking to neutralize, is equally important with the size of the dose.

Strychnine excites peristalsis by direct stimulation of the motor centers. Motor waves thus induced extend to all the structures which would receive them if the centers were acting normally or without artificial stimulation. The arrest of intestinal motion by morphine is most marked during the primary effects of each dose, but as the primary effects of the drug wear

away, peristalsis gradually becomes reëstablished. Drug users, as a rule, take their drug only during the day, or from the time of rising in the morning until bedtime, say from 8 A.M. to 10 P.M. During these hours the system is kept constantly under the primary effects of the drug and intestinal motion is very much restricted, but during the period between 10 P.M. and 8 A.M. the effects of the day's dosing wear away and peristalsis becomes fairly active. It is during the latter part of this period that the excretory organs do the principal part of their work.

In order to secure prompt action of purgatives, advantage must be taken of this state of affairs. The remedies must also be so compounded and be given at such times as to have the acme of their effects, both as motor and secretory stimulants, occur during that part of this period when the system is least under the restraining influence of the opiate. To do this, begin with the purgative course at 2 P.M., and give on an empty stomach a dose every two hours until 10 P.M. For an average patient taking ten grains or more of morphine a day the following will be found effective:

Calomel, grains x;
Extract of cascara sagrada, grains x;
Podophyllin, grain j;
Ipecac, grain j;
Atropine, grain 1/50;
Strychnine nitrate, grain ¼.

Ft. caps. No. 5. Sig.: One at 2, 4, 6, 8, and 10 P.M.

It will be noticed that these capsules contain one-twentieth grain of strychnine each, and that one is to be given every two hours until five such doses are given, making one-quarter grain of strychnine in eight hours. These would be excessive doses for one not under the influence of an opiate, but it must be remembered that morphine opposes strychnine in almost all its range of action, and that we are seeking to overcome its paralyzing action on the motor function of the bowel, and unless a quantity sufficient to do this is given the secretory stimulants will simply stir up a storm in the upper part of the intestinal canal, accompanied by nausea, vomiting, and other distress, but no bowel actions will occur. It is more than likely that this storm will have to be allayed by an increased dose of the opiate.

During the time these purgative capsules are being given the patient should have his usual dose of morphine, but none must be given from the time of giving the last purgative capsule until free evacuations have been obtained. The physician should take charge of the patient's drug supply at the time of beginning the purgative course and control it from that time on. If left to the patient, he will take a dose at an inopportune time and thus delay or prevent the action of the purgative.

The strychnine and atropine in these capsules will excite a fair degree of peristalsis notwithstanding the restraining effects of the opiate, and this will usually enable the glandular stimulants given with them to induce free evacuation from the bowel in eight to ten hours from the time of giving the last purgative capsule, thus securing bowel movements before the time for the next morning dose of morphine; but more certainly to accomplish this result, six hours from the time of giving the last purgative capsule give one-twentieth grain of strychnine hypodermically and follow in half an hour with two ounces of castor oil or a full dose of salts, and repeat both the strychnine and the oil or salts at intervals of two hours, until the intestinal canal has been thoroughly emptied.

THE IMMEDIATE EFFECT ON THE COMPLEMENT FIXATION TEST FOR LUES OF TREATMENT WITH SALVARSAN.

CRAIG states in the *Archives of Internal Medicine* of September 15, 1911, that from the analyses of complement fixation tests after the administration of salvarsan which are given in this paper, he believes that the following conclusions may be safely drawn:

1. The best results, as regards the disappearance of the complement fixation test and the occurrence of relapses, are obtained in the treatment of patients in the primary

stage of lues, and the poorest in the treatment of those in the tertiary stage.

2. The complement fixation reaction disappears somewhat more rapidly after treatment with salvarsan in the tertiary stage than in either the primary or secondary stage of the disease.

3. The reaction in his experience has disappeared during the second, third, and fourth weeks after treatment in the vast majority of the negative cases.

4. The prognosis, both as regards the disappearance of the reaction and the occurrence of relapses, is most favorable in patients giving a plus-minus reaction, and least so in those giving a double-plus reaction.

5. As regards the method of administration of salvarsan the best results have been obtained, in the author's experience, from the intramuscular injection of the alkaline solution, and the poorest from the use of the neutral suspension. In justice to the intravenous method, however, it should be stated that a smaller number of cases have been tested, and it may be that this method will prove as efficient as the intramuscular.

6. The complement fixation reaction disappears more rapidly after the intravenous administration of salvarsan than after the intramuscular administration.

7. As regards the disappearance of the complement fixation reaction better results were obtained in patients who had previously received mercurial treatment than in those who had not, but the time of disappearance of the reaction was little affected.

8. The great superiority of salvarsan over mercury, as a specific remedy, was shown in the rapid and apparently permanent disappearance of the reaction, after one or two injections of the drug, in patients previously treated for one, two, or three years with mercurials and in whom the reaction had remained positive.

9. The complement fixation test is of the very greatest value as a guide to treatment with salvarsan, and it is the only method we possess of determining whether lues is actually cured by any therapeutic agent.

Finally, the author believes that the data recorded in this paper eloquently sustain Ehrlich's modest claim that "the introduction of '606' makes a considerable advance in the therapy of syphilis, an advance which is not due to accident, but to the result of systematic experimental work."

TREATMENT OF GOUT WITH MINERAL ACIDS.

The *Medical Record* of September 16, 1911, states, editorially, that a generation ago an English practitioner, who was an unattached individualist, created quite a sensation by publishing numerous cases from the ranks of his aristocratic patrons, in which reports he always gave the antecedent treatment as prescribed by other notables (whose names he invariably repeated, and whose prescriptions he regularly reproduced). His method was often simplicity itself. After a client had consulted some world-famous authority (who stood sponsor for a special therapeutic principle), and had become decidedly worse as a result, our individualist simply reversed the principle of the treatment, and—if we choose to believe him—promptly cured the patient. Apparently he went no further into the rationale of the treatment. Thus if a peer had chanced to consult Sir William Gull for his gouty paroxysms and had become distinctly worse after large doses of alkalies, the individualist merely changed the treatment to full doses of nitric acid, whereupon the patient at once experienced decided relief.

Quite recently Schmidt, of Frankfort, has advocated the use of hydrochloric acid in persistent high doses for certain cases of gout. But unlike the English empiricist he has a definite reason for this procedure, which, moreover, has its special indications. The treatment did not originate with him, for long ago the discovery was made that gouty patients often suffer habitually from defect of acid in the stomach. The biochemical studies which throw light on this mechanism are too numerous and complicated to be cited in this connection. They naturally involve the entire biochemical

pathology of gout and uricemia, and eventually of all the chronic affections which are found associated with gout.

Without at present going deeper into the subject, we may simply call attention to the fact, which the author insists upon, that iodides should be combined with hydrochloric acid in these cases. Alkalies are still the remedy in the so-called uratic diathesis, which, however, furnishes but a fraction of the cases of clinical gout.

IODINE IN SKIN STERILIZATION.

Dr. J. WESLEY BOVEE, of Washington, D. C., summarizes his observations and experiments as follows: (1) So far as could be ascertained by culturing epidermic scrapings, weak dilutions of iodine, even to 5 per cent of the official tincture, thoroughly sterilized the surface of the skin for a period of time lasting from two minutes after its application to fifteen minutes after. While this inhibitive action of absolute alcohol was quite potent, this property was greatly enhanced by the addition of iodine to an equivalent of 5 per cent of the U. S. P. tincture. (2) Pubic hair placed in iodine dilutions of 5, 10, 20, 30, and 40 per cent strength (of official tincture) respectively, for two, three, five, eight, ten, twelve, and fifteen minutes respectively, all showed growths after three days incubation, while using 50-per-cent dilutions under the same conditions practically always prevented growths. (3) Control scrapings of skin taken from the abdomen above the umbilicus over periods of time varying from two minutes to two hours, when 40-per-cent dilutions were used, always showed negative results as to colonies. (4) Cultures from hair and skin that had been subjected to 50-per-cent dilution of tincture of iodine never produced growths. (5) Tincture of iodine diluted with an equal amount of absolute alcohol might be considered reliable as a local application in preparation of the skin or mucosa in any part of the body. Dilutions of less strength were unreliable if hairs or large hair follicles were in the field of operation. (6) The 50-per-cent dilution of tincture of iodine, if not carelessly applied, is not liable to injure the skin.—*Medical Record,* Oct. 14, 1911.

TREATMENT OF LOCAL SORES BY CARBON DIOXIDE SNOW.

In the *Indian Medical Gazette* for September, 1911, JEUDWINE reminds his readers that this method of treatment is comparatively recent, and ventures to give the results of his experience during the last three months, feeling sure that this method will become universally adopted as it becomes more widely known.

Preparation of the Snow.—It is unnecessary to enter into a detailed description of the preparation of the snow as that has already been done before, but there is one point about the collection of the gas from the cylinder which may be of use. From experience he found that the preparatory use of a roll of paper swathed in bandages and a towel was not satisfactory. The roll of paper could be easily made too large or too small to fit over the orifice when the gas escaped—in this case gas either escaped in large quanities or the roll would not fit on and necessitated remaking.

Again, the slightest kink in the roll of paper caused the gas to solidify at that place and often caused the roll to be left half empty. Instead of this method the writer had a metal foil pipe made, costing 4 annas; it is the same length as a piece of foolscap paper. One end is made so as to fit easily over the brass knob when the gas escapes, and the other end is slightly larger; into this when in use is put a roll of foolscap paper and the tube adjusted to the cylinder. A cork is placed in the top end, a pad of cotton-wool applied, and a hand towel wrapped round. Gas is quietly and easily collected in solid form, little is wasted, and no elaborate preparations are necessary.

The author has made the CO_2 snow during May and June (with a temperature of 118° in the shade) by this means. The total number of cases treated up to date

has been 74, and no failure has been reported.

The cases treated have been various, and include local sores, of a few weeks' duration up to three years, varying in size from a third bit to a patch 3 x 1½ inches, in people from one to fifty years of age. They have been on the face, lips, nose, hands, fingers, arm, leg, thigh, feet, toes, and body.

The length of time the snow should be applied was a matter of experiment, as the author asserts he had seen only one case treated and had read nothing about it. He began with half-minute applications in children, on soft parts such as the face, and in recent cases, and varied it up to one minute for adults, on hard parts such as the foot, shin bone, hand, and in chronic cases.

For the last two months he has given one-minute applications in all cases irrespective of age, position, or duration, and has seen no harm result. A good deal of reaction ensues in many cases; but frequently a cure is effected by a single application.

The interval elapsing between applications varies with the reaction and effect produced.

At first he made patients come for a second application on the seventh day, but by experience he found that as a rule no second application seemed necessary for ten to fourteen days, especially when a one-minute application had been made.

As long as the sore had a clean base and a healthy healing edge, a second or subsequent application did not seem to be necessary, but if the sore required further stimulation, a second application was made on the seventh day, or whenever the patient presented himself. The duration of the second or subsequent application varied with the amount of stimulation considered necessary, from one-half minute to one and one-half minutes in very chronic cases.

In many cases a single application of one minute has been sufficient to produce a cure.

The question arises as to the number of applications which should be made on one sore at the same sitting, when the sore cannot be covered all at once by the CO_2 pencil; that is to say, does any harm result from applying CO_2 for one minute over a large area of a sore at one sitting?

The writer has made six applications at one sitting over a sore 3x1½ inches with a CO_2 pencil 1½ inches in diameter; each application was one minute, and the edges of the applications touched. No ill result followed; in fact, the patient came up again ten days later, when the sore was smaller in area.

Warts.—The writer has only treated two warts: one case was not reported; the other case was cured in two applications, one minute duration at an interval of one week. There has been no recrudescence during the last three months.

Chronic ulcers react in the same way as local sores.

This report, Jeudwine thinks, may be of use in showing:

1. That CO_2 snow can be prepared during the hot weather.

2. That by using a metal tube there is a saving of gas and labor.

3. That applications for one minute seem to produce a sufficient and not excessive reaction in patients of all ages, various sites, and different duration of sores.

4. The treatment is efficient and is practically painless.

DILATATION OF THE HEART IN THE ACUTE FEVERS.

Writing upon this topic in the *New York Medical Journal* of September 9, 1911, BROOKS states that as to the advisability of attempted control of overaction of the heart in acute fevers he is as yet undecided. Some cases seem to do better when we allow the heart to take its own way in this respect, and undoubtedly, at least to a certain extent, the rapidity of the heart is in a way a physiological reaction. He is convinced that drugs should not be given for the purpose of slowing the heart in these cases, and has during late years entirely discontinued the use of aconite and, to a large extent, that of digitalis and its group in cases of this

kind, although when a previously diseased heart is known to exist it may be desirable from the first to give digitalis to get the necessary rein on the heart so that it may better respond to quick stimulation if necessary later on in the disease. The ice-bag to the precordium is his favorite in the acute fevers, and when it is apparently accentuated by nervous stimulation, he likes to use codeine, the bromides, and morphine, all drugs having, he believes, most excellent effects in this condition and being entirely free from integral toxic effects on the heart muscle. Again, he refers to the advisability of venesection in many instances, especially in full-blooded patients.

In the control of high temperature the author does not believe that coal-tar products should be used, although they often reduce the excessive temperature very promptly, and in diseases of short duration may occasionally be given with little risk. They are all more or less poisons to the cardiac muscle, and are therefore more apt to add to the degeneration in these diseases than to lessen it through reduction of the fever. Again, he believes that alcohol sponges, cold-water packs, ice-water enemata, spray baths, and the like are the most safe measures. When quinine, aspirin, or other salicylic compounds act as febrifuges, these drugs may, he thinks, be used with safety. As a rule, however, except in specific indications, they have very little effect in this direction.

Among general methods to be put into execution for the prevention of dilatation in the fevers, is primarily the removal of every unnecessary strain on the circulatory apparatus. Rest in bed, with the interdiction of certain movements, such as sudden sitting up, or turning, is very necessary. Relief from mental excitement and stress and from any other factor which may cause a rise of the blood-pressure, especially a sudden one, or which may excite increased rapidity in the heart action, is very essential.

The writer passes very quickly over the discussion of the management of acute dilatation of the heart when it has developed, because he believes that we all agree very largely on this point—we all do about the same things—and that once the acute dilatation arises, we all get about equally bad results. There are, however, a few points which he does bring up for discussion. He does not favor digitalis in the acute condition, though he does employ it in convalescence. In many instances, as graphically stated by MacKenzie, it does render the action of the heart worse, the pulse more irregular, due to accentuation of defective bundle conductivity, and in most instances its stimulative effects, if any be obtained, are achieved too late to do any good. The drugs which he does use are morphine to quiet the pain, lessen the nervous excitement and distress, and, possibly at the same time, to lessen the tension on the general circulation; strychnine may be given for its action on the muscle, adrenalin for raising the pressure to an adequate point when it suddenly falls, camphor hypodermically for its somewhat similar action, and, most important of all, bleeding to relieve the overdistended right heart. Posture may also materially assist. The ice-bag must be removed from the cardiac area when actual dilatation arises in its acute form, for the author believes it renders the muscle contraction still more efficient, and it certainly increases irregularity, although it may lessen rapidity.

He is fully convinced that, as a class, we have paid too little attention to the conservation of the heart muscle in convalescence from acute fevers, and too little importance is likely to be attached to the condition of the myocardium during this stage, even when we fully recognize that the heart muscle must have been compromised.

The writer states he has made the sad mistake more than once of allowing the patient to get up too soon or otherwise to submit his circulation to too much strain. As a result he has undoubtedly permitted the development of a chronically diseased myocardium where a little longer in bed, a little more attention when the patient first began to sit up and to walk about, might have restored a normal heart to a patient

who became thereafter a chronic sufferer from myocardial insufficiency.

The patient with, or convalescing from, the acute fevers should rest in bed. Blood-pressure and strain must be kept down by hygienic and dietetic measures, or, if necessary, by bloodletting or sedatives, until the heart muscle has been able to regenerate itself. The natural tendency in parenchymatous degeneration of the myocardium is toward recovery, but if strain is put upon the heart too early and before this restitution has taken place, aneurism, fibrosis, or a fatty degeneration is sure to follow.

The diet should not contain too much fluid, and fatty foods, the starches, and sugars should be curtailed. Other conditions not contraindicating, the author is strongly in favor of a highly nitrogenous diet in this stage of convalescence.

TREATMENT OF SEROFIBRINOUS PLEURISY AND EMPYEMA IN PNEUMONIA.

ANDERS and MORGAN in the *Journal of the American Medical Association* of October 7, 1911, tell us that in non-pneumococcic pleurisy of the serofibrinous variety it is the custom of many clinicians to aspirate early, and they believe that the disease has in the past been too conservatively treated. When dealing with either serofibrinous pleuritis or empyema occurring secondary to pneumonia, however, an expectant method, unless thoracentesis be urgently needed, is to be adopted until the crisis has been passed, but if the latter fail to appear at the proper time, then the exudate should be promptly withdrawn. On the other hand, if a critical decline of temperature takes place in due season, a serofibrinous effusion is quickly absorbed in some cases at least, but if not, then recovery must be enhanced by puncture followed by aspiration.

If a massive effusion develop during the fastigium of pneumonia, displacing the heart and other adjacent organs, or if under these circumstances signs of involvement of the non-affected side, such as moist râles, bronchovesicular breathing, and impaired resonance arise, and finally, serious symptoms such as urgent dyspnea or syncopal attacks with cyanosis manifest themselves, the withdrawal of the exudate is to be advised. Such cases, however, may demand more radical operative measures for their cure after the usual crises, and these should not be too long withheld. Aspiration during the fastigium is a procedure calculated to do harm on account of the slight shock induced by it, hence it should be undertaken only in cases presenting large pleural collections which give rise to the untoward effects already stated.

The authors desire to state with emphasis that their results from aspiration for pleural effusion in pneumonia prior to the crisis, in patients that have been desperately ill, have been decidedly discouraging.

The aim in the treatment of individual cases of pneumonia in which pleurisy in one of its different forms is associated, is to secure the largest possible degree of comfort to the patient and the withdrawal of the exudate, if it should occur, at the earliest moment compatible with safety to life.

The indications for the use of medicinal substances in complicating pleurisy are few, and nothing in the nature of a depressant, especially such as the coal-tar products, is permissible, since pneumonia, the primary disease, debilitates every organ of the body, notably the heart. To be avoided also, therefore, are salicylates, although these as well as quinine and opium exercise a more or less favorable effect in serous pleuritis in general. Opium is also open to objection in the more advanced stages of pneumonia, especially should the bronchi contain secretory products, since the drug exerts a drying effect, thus hindering their dislodgment. A pneumococcus pleuritis may develop and accompany the pneumonic process from the beginning, in which case opium may have great usefulness as a therapeutic agent in the earlier stages, relieving the pain and inducing repose.

Experience dictates that quinine has a beneficial influence on an inflamed serous membrane, and it possesses a limited value in the pleuritis of pneumonia, both as a supportive agent and in mitigating the intensity of the inflammatory process. It may be administered in 4-grain doses in capsule, followed immediately by a few drops of dilute hydrochloric acid, to insure its prompt solution, four times daily.

In cases of pneumonia in which severe pains due to associated pleurisy develop early, fixation of the affected area by means of strips of adhesive plaster is an effective and feasible measure. These should be, however, removed in the event of the occurrence of effusion. The use of morphine in small doses, administered hypodermically, is not objectionable during the earlier stages of pneumonia, if demanded for the relief of intense pains that remain unrelieved by immobilization of the side involved. On the other hand, in light grades of associated pleurisy, counter-irritation by means of sinapisms is to be advised. In the adult, if the patient's nervous system be not too sensitively organized, cold applied in the form of an ice-bag, or ice-water bag, or better still, cold compresses, reapplied at least every hour, as suggested by Baruch, with the least possible disturbance to the patient, is a remedy of choice.

One is quite convinced of the extreme importance of affording prompt relief of the pain, so as to enable the function of respiration to be carried on the more actively, and thus also to preserve the nervous tone and equilibrium of the patient.

SIMPLIFIED INFANT FEEDING.

DENNETT in the *American Journal of Obstetrics* for October, 1911, writing on this important topic says that pediatrists on this side of the water have made infant feeding so complicated that only rarely has the general practitioner attempted to follow them. The German and French pediatrists have never accepted our views on the subject. Until last year the author has practiced and taught percentage feeding, cream and whey mixtures, the use of gruels made from the various cereals, and has followed other fads as they came along. He was much surprised, therefore, after he began feeding simple milk, water, and sugar mixtures, to find how much better babies got along than they did on the complicated feedings. It is rather humiliating to the pediatrist when he realizes that many general practitioners have always employed these simple milk mixtures more or less successfully even though they have not been used with any very definite system in mind.

The system of infant feeding with which this paper deals is based upon the caloric needs of infants, but does not require the mathematical calculation of the calories in each case. It is founded upon the results obtained in the author's own cases. He has reckoned the calories in each one of these most carefully and has formulated general rules which for all practical purposes are just as good as reckoning calories in each case.

There is just one principle involved—that is, a child will thrive and gain upon a given amount of whole milk and sugar, which amount is proportionate to its weight. This must be diluted with water, but the amount of water or the dilution is not of the utmost importance. However, the food should be made as dilute as is practicable by adding to the milk and sugar sufficient water to bring the total amount taken in twenty-four hours up to the full capacity of the baby. A baby requires so many ounces of milk and so many ounces of sugar for each pound of its weight.

Regardless of how strong this mixture may be, up to a certain limit, the healthy baby will digest it well, gain, and thrive. The main point is to give the baby the amount of actual milk and sugar that he needs; in other words, the number of calories necessary to make him gain. This, of course, applies only to babies having no digestive disturbances at the time. If there is vomiting or intestinal dyspepsia, a food which does not fill his caloric requirements must be used temporarily, and it must be gradually increased after the disturbance

has been overcome, always bearing in mind what his requirements are.

In order to make this system as simple as possible for the general practitioner, a fixed amount of sugar is given to all babies who have no digestive disturbances, except perhaps a baby under one month of age. This amount of sugar is 1½ ounces to the total twenty-four-hour quantity of food. Cane-sugar may be used, but the author has found that malt-sugar gives the best results. The malt-sugar that he has used is dextri-maltose, which is composed of almost equal parts of dextrine and maltose. Two tablespoonfuls of cane-sugar, leveled with a knife, make an ounce. Two heaping tablespoonfuls of dextri-maltose, all that can be gotten upon a tablespoon, make an ounce. If the average milk having a fat content of 4 per cent is used, an infant requires in twenty-four hours twice as many ounces of milk as he weighs in pounds, and enough water is added to make the correct twenty-four-hour quantity for the given infant's weight and age.

To illustrate: A baby who has no digestive disturbances, perhaps three months of age, weighing 12 pounds, would take 4 ounces every two and a half hours, or eight feedings in twenty-four hours, making a total twenty-four-hour quantity of 36 ounces. Since he needs twice the number of ounces of milk as he weighs in pounds, his food would be made by taking 24 ounces of whole milk, 12 ounces of water, and 1½ ounces of sugar. This mixture is two-thirds milk and one-third water, which for a baby of three months of age would seem a very irrational feeding to one who has never used this method. The writer's experience is that such a food is digested with ease, if it has been gradually increased in strength. This does not seem so remarkable in view of the fact that French pediatrists feed their babies undiluted milk almost from birth.

The total quantity in twenty-four hours depends upon the age, weight, and digestive capacity of the baby. As a rule one ounce more than the number of months of the baby's age should be given at each feeding. This does not hold true under one month of age, when the quantity of each feeding should be increased to 2½ ounces as rapidly as the baby will take it, since in this way he gets 25 ounces in twenty-four hours, and the mixture may therefore be more dilute. It is never necessary to give older infants more than 8 ounces at a feeding, or 48 ounces in twenty-four hours. Babies should be fed at two-hour intervals, ten feedings in twenty-four hours up to three or four months of age, or when having digestive disturbances, or often in beginning artificial feeding, since this enables us to give a larger twenty-four-hour quantity, and therefore a more dilute milk.

There are four classes of babies to which this rule does not apply:

1. The new-born babe.
2. Fat infants over eight months of age.
3. Atrophic or marasmic babies.
4. Babies with digestive disturbances.

New-born Babies.—When we realize that breast-fed infants do not show a gain in weight in the first ten days or two weeks, we need not expect to make our bottle babies do better than this. We are, therefore, content to begin on weak foods which do not come up to the caloric requirements of the baby in order that we may educate his digestion by gradually increasing the strength of the food, until he gets enough milk and sugar in twenty-four hours to permit of a gain. After an initial day of starvation we would, therefore, give him a mixture of one-quarter milk and three-quarters water with no sugar added. If he were taking 1 ounce every two hours, ten feedings in twenty-four hours, the mixture would then be made of 2½ ounces of milk and 7½ ounces of water. This is given for about two days. The next change would be to add sugar and increase the quantity of food given at each feeding. He would probably take 1½ ounces every two hours, and we would make the food 4 ounces of milk, 12 ounces of water, and an even tablespoonful of sugar, for two days. The baby then being a week old would probably take 2 ounces at a feeding—20 ounces in twenty-four hours, which is made by adding 7

ounces of milk to 13 ounces of water, and two tablespoonfuls of sugar. From this time on the sugar is gradually increased up to 1 ounce in twenty-four hours, and the milk increased up to 10 ounces, adding 10 ounces of water. Food of this strength may be easily given at the end of the third week, and it contains enough calories for the average 7-pound baby to gain upon, since he sleeps twenty-two hours out of every twenty-four, and does not require as much food in proportion to his weight as an older baby. In other words, a baby during the first month of life will gain upon one hundred calories per kilo, or one and one-half times as much milk in ounces as he weighs in pounds, with the addition of 1 ounce of sugar in twenty-four hours.

Fat Infants Over Eight Months of Age.—The body surface is decreased in proportion to the weight. In any one who is fat there is, therefore, less radiation of heat and less loss of energy through this source. For that reason fat babies do not require as much food as thin ones. After eight months of age they do well on 100 to 110 calories per kilo. For this reason we must modify our rule by giving 4 to 6 ounces less of milk in twenty-four hours or by decreasing the amount of sugar. In doing this we must remember that 1 ounce of sugar has the same caloric value as 6 ounces of milk.

Atrophic or Marasmic Babies.—In the same way, then, emaciated babies have a greatly increased body surface, and need more food than the normal baby. They also use up a lot of energy by increased muscular effort, since they cry a great deal and are apt to be very restless. After any digestive disturbances are overcome, much more food is necessary to make them gain than a normal baby requires. The total food value may be greatly increased, if the baby's digestion will stand it, by giving 2 ounces of sugar instead of 1½ ounces in the twenty-four hours; or 3 to 5 more ounces of milk more than the normal baby requires may be added in twenty-four hours to satisfy this extra need. For instance, a marasmic baby of four months, weighing 8½ pounds, would take a food made up of 17 ounces of water, 2 ounces of sugar, and 19 ounces of milk, which would give that baby 152 calories per kilo; or, by continuing with 1½ ounces of sugar, and increasing the milk 3 ounces, we might make the food 20 ounces of milk, 16 ounces of water, and 1½ ounces of sugar.

Babies with Digestive Disturbances.—It is surprising to see how babies with both gastric and intestinal indigestion improve on a diluted milk and water mixture when the sugar is omitted for a time. The baby with undigested stools may be put upon a mixture of one-quarter to one-third milk, and there is usually a marked improvement within a few days. It also seems to improve the digestibility of the milk if the mixture is brought to a boil. Often the stools become normal within three or four days; then a tablespoonful of sugar is added, and the proportion of milk increased. At intervals of two days the sugar is increased and the proportion of the milk strengthened until the infant is getting his required amount of food in twenty-four hours, according to the general rule the author has given. This should be done very carefully and slowly, when the baby has had any prolonged digestive disturbance. In these cases a cathartic and period of starvation are often harmful. Children with either gastric or intestinal indigestion should be fed at two-hour intervals, because in this way a larger amount of food may be given without making the food too concentrated.

Babies with vomiting also do well when given milk and water mixtures without sugar; with them, however, it is more important that the quantity at each feeding be small than it is to have the milk greatly diluted. For instance, a baby getting 10 ounces of milk and 20 ounces of water, 3 ounces every two hours, may vomit constantly. A mixture of 10 ounces of milk and 10 ounces of water, of which 2 ounces is given every two hours, will often stop the vomiting at once. The quantity at each feeding is therefore of great importance. In any of these digestive disturbances we

should bear in mind the requirements of that particular baby, and aim to strengthen the food as fast as the digestion will permit. We must not expect to get a gain in weight until the caloric requirements have been fulfilled.

A SIMPLE DIET CARD AND ITS USE.

WHITE in the *Boston Medical and Surgical Journal* of October 12, 1911, advises the use of a diet card on the following basis:

In fevers and other conditions where a liquid diet is largely used, a knowledge of food value is very important. There is great difference in the food value of different liquids. The table gives the following:

One glass of milk equals 160 calories.

One glass of ¾ milk and ¼ (4 tablespoons) 20-per-cent cream equals 240 calories.

An egg-nog (1 glass milk, 1 egg, 2 teaspoons sugar) equals approximately 300 calories.

A plate of cream soup equals 160 calories.

A glass of skimmed milk or buttermilk equals 80 calories.

An equal amount of gruel equals 75 calories.

A glass of albumin water (white of 1 egg) equals 20 calories.

A cup of beef tea or clear soup equals 5-20 calories.

Let us take a 150-pound patient in bed who needs, approximately, 1800 calories a day and who receives ten feedings of a glass (8 ounces) of liquids a day. Some combinations of liquids allowing for agreeable variety will abundantly nourish him, other combinations mean partial starvation. Two glasses each of milk (320), gruel (150), thickened soup (320), egg-nog (600), milk and cream mixture (480); total, 1870 calories.

Two glasses each of milk (320), buttermilk (160), gruel (150), albumin water (40), and beef tea (20); total, 690 calories.

A diet like the last, or only one-half or one-third as large, is often given to invalids and the loss of weight attributed to "wasting disease."

It is well to look over the fever diet and see if it is sufficient. The card helps us to do this easily.

It is easy to increase the food value of a liquid food. Take a glass of milk, 160 calories—each addition of a tablespoon of cream (20 per cent) gives 30 more calories; each addition of a teaspoon of sugar (preferably milk-sugar) 33 more calories; an addition of an egg gives 70 more calories.

The great value of soft solids in fever is easily seen. One tablespoon (½ ounce) milk equals 10 calories, a heaping tablespoon of cooked cereal equals 35 calories, of custard 55 calories, and of ice cream 135 calories.

Coleman has recently shown how it is possible to give typhoid patients 4000 to 5000 calories a day on a diet of milk, cream, milk-sugar, and eggs, without disturbing digestion, and to carry them through their fever with little loss of weight.

To treat diabetes properly, we must know the amount of carbohydrate eaten as well as the amount in the urine—so many grammes eaten, so many grammes passed. We must be able to reduce the amount of carbohydrate eaten regularly and systematically to get the patient's urine sugar-free, and later to increase the amount of carbohydrate definitely and cautiously up to the limit of "tolerance."

Slipshod dieting is responsible for the majority of poor results in the treatment of diabetes. The use of the diet card will help to prevent this. The chief articles containing very little or no carbohydrate are easily seen, such as meat, fish, eggs, cheese, butter, olive oil, clear soups, olives. Add to this tea and coffee and the green or "fodder" vegetables (which are not charted because of their small food value, but are useful for flavor and variety, and as carriers of butter, cream, and olive oil), and we have the "strict diet" which every diabetic takes and takes freely.

In contrast to this we have the carbohydrate food, which must be carefully watched and definitely controlled and varied

in amount to suit the individual case. We can quickly estimate the amount of carbohydrate a diabetic is taking at the beginning of treatment if he will give us a simple record of the amount of food eaten at his meals. If, in addition to meat, fish, eggs, clear soups, fats, and greens, he takes, for example, 1 orange (15), 6 tablespoons oatmeal (6x7), 6 slices bread (6x13), 4 tablespoons cream (4x½), 6 teaspoons sugar (6x8), 2 medium potatoes (2x20), 3 tablespoons peas (3x5), 4 tablespoons pudding (4x13), 2 slices sponge-cake (2x13), we have a total of approximately 318 grammes of carbohydrate.

If we wish to give our diabetic approximately 100 grammes of carbohydrate, we may order the "strict diet" plus ½ orange (½x15), 3 tablespoons oatmeal (3x7), 3 slices bread (3x13), 1½ potatoes (1½x20), and 5 tablespoons of cream (5x½).

If we wish 20 grammes of carbohydrate we may give "strict diet" plus ½ glass milk (½x12) and two tablespoons oatmeal (2x7).

If we wish 10 grammes of carbohydrate, we may add 10 tablespoons cream (10x½) and ½ grape fruit (5) to the "strict diet."

"Strict diets" may prove scanty in nourishment unless some advice is given about amount. It is often wise to be sure of 1000 calories by advising the patient to eat each day at least 3 eggs (3x75), 8 teaspoons olive oil (8x37), and 6 pats (2 ounces) of butter (6x80).

The diet card is an easy means of arranging diabetic diets.

It is almost as necessary to watch the amount of proteid eaten in nephritis as the amount of carbohydrate in diabetes. We usually wish to give a low proteid diet to spare the kidney. Many cases improve surprisingly on it.

Many a doctor would like to plan a low proteid diet, but does not know how, and contents himself with "not much meat and plenty of milk," with the result that more proteid than ever is eaten. The diet card makes it easy to plan a diet containing 50 or 60 or 70 grammes of proteid or any other desired amount. In acute nephritis we may give approximately 50 grammes of proteid as follows: 4 glasses of milk (4x 7.5), 1 glass (16 tablespoons) cream (16x ½), 2 plates of thickened soups (2x5.5), 11 teaspoons milk-sugar. This bill of fare gives approximately 1800 calories and between 1½ and 2 quarts of liquids.

Later we may give approximately 65 grammes of proteid as follows: 6 glasses of milk (6x7.5), 1½ glasses (24 tablespoons) of cream (24x½), 3 tablespoons of rice (3x1), 2 slices of toast (2x2.3), 6 pats of butter, and 4 teaspoons of sugar. This gives approximately 2500 calories and 2 quarts of liquids.

In a chronic case we may give 70 grammes of proteid as follows: 4 slices of bread (4x2.3), 2 eggs (2x6.5), 2 slices of meat (2x11.5), 2 glasses of milk (2x7.5). This adds up to 60 grammes of proteid. We would fill out the bill of fare with butter, cream, sugar, flour soups, starchy vegetables, greens, olive oil, etc. A plate of flour soup (5.5) and 5 tablespoons of rice, mashed potato or corn (5x1) would give approximately another 10 grammes of proteid. Total, 70 grammes.

We must remember to give enough food for body needs in all chronic cases, to make up with fats and carbohydrate for the proteid we have cut out. A pleasant variety of food makes this much easier for the patient. Foods with a low per cent of proteid and high food value are especially useful, such as cream, cake, mashed potato, rice, etc. It is not necessary to plan every dish the patient eats and estimate its caloric value. It is much simpler and just as satisfactory to prescribe the proteids definitely and decide whether the needed fats and carbohydrates are taken by weighing the patient now and then and judging his strength and general condition.

It goes without saying that we must consider many other features of the food in nephritis besides proteids and food value, such as the amount of water, salt, and irritant substances.

The diet card helps us to apply the well-known principles in the treatment of obesity, namely, to give a diet which has less food

FOOD VALUES IN HOUSEHOLD MEASURES.*

Foods as Eaten.	Actual amount.	Household measure.	Approximate.			
			Calories.	Grammes.		
				Proteid.	Fat.	Carbohydrate.
Dairy.						
Milk	8 ozs.	A glass.	160	7.5	9.5	12.
Skimmed milk and buttermilk	8 ozs.	A glass.	80	7.5	1.	11.5
Cream (thin (20 per cent))	16 grms.	A tablespoon.	30	.5	3.	.5
Cream (thick (40 per cent))	16 grms.	A tablespoon.	60	.5	6.	.5
Condensed milk (sweetened)	20 grms.	A heaping teaspoon.	70	2.	2.	11.5
Condensed milk (unsweetened)	20 grms.	A heaping teaspoon.	35	2.	2.	2.5
Butter	10 grms.	A pat or ball.	80		8.5	
Cheese (Cream)	15 grms.	One-inch cube.	65	4.	5.	.5
Cheese (Skim-milk)	15 grms.	One-inch cube.	45	4.5	2.5	.5
Cheese (American)	15 grms.	One-inch cube.	70	4.	5.5	
Eggs, whole	50 grms.	One.	75	6.5	5.	
Eggs, yolk	15 grms.	One.	55	2.5	5.	
Meat and Fish (cooked).						
Beef tea, clear soups	5 ozs.	A teacup.	5-20	1.-4.5		.5
Fish (lean (cod, flounder))	50 grms.	A heaping tablespoon.	35	8.5		
Fish (fat (shad, salmon))	50 grms.	A heaping tablespoon.	105	11.	6.5	
Meat (lean)	50 grms.	A medium slice.	70	11.5	2.5	
Meat (medium fat)	50 grms.	5x3x¼ inch.	150	11.5	9.	
Meat (fat)	50 grms.	5x3x¼ inch.	200	8.5	18.	
Oysters, medium size (raw)	16 grms.	One.	8	1.	.2	.5
Cereals and Vegetables (cooked).						
Bread, white or Graham	25 grms.	One slice, 4x4x½ inch.	70	2.3	.5	13.
Vienna roll	40 grms.	One.	115	3.5	1.	22.5
Crackers (Uneeda)	7 grms.	One.	30	.5	.5	5.
Cereals, cooked, moist	40 grms.	A heaping tablespoon.	35	1.		7.
Cereals, eaten dry	5 grms.	A heaping tablespoon.	20	.3		4.
Shredded wheat	30 grms.	One.	110	3.	.5	23.
Gruels (cereal)	8 ozs.	A soup plate.	75	2.5	1.	14.
Thickened or cream soups	8 ozs.	A soup plate.	160	5.5	4.5	24.
Macaroni	25 grms.	A heaping tablespoon.	25	1.	.5	4.
Potato, boiled or baked	95 grms	One medium.	90	2.		20.
Potato, mashed	35 grms.	A heaping tablespoon.	40	1.	1.	6.
Rice, boiled	30 grms.	A heaping tablespoon.	35	1.		7.
Corn, canned	35 grms.	A heaping tablespoon.	35	1.	.5	6.5
Peas, fresh	35 grms.	A heaping tablespoon.	40	2.5	1.	5.
Lima beans, canned	25 grms.	A heaping tablespoon.	20	1.		3.5
Squash	35 grms.	A heaping tablespoon.	20	.5		3.5
Fruits.						
Apple, pear	120 grms.	One medium size.	75	.5	.5	17.
Apple sauce	45 grms.	A heaping tablespoon.	70		.5	16.5
Banana	100 grms.	One medium size.	100	1.5	.5	22.
Orange	130 grms.	One medium size	70	1.		15.
Strawberries	100 grms.	A medium saucerful.	40	1.	.5	7.5
Dried figs, dates, raisins	100 grms.	A medium saucerful.	350	2.5	3.	76.
Fruit jelly, sweetened	50 grms.	A heaping tablespoon.	160	.5		38.5
Desserts.						
Custard	40 grms.	A heaping tablespoon.	55	2.5	.5	9.
Ice cream	40 grms.	A heaping tablespoon.	135	1.5	9.	11.
Sponge cake	20 grms.	A slice 2x4x¼ inch.	75	1.5	2.	13.
Pudding (rice, tapioca, bread)	45 grms.	A heaping tablespoon.	80	2.	2.	13.
Alcohol.	12 grms.	A tablespoon.	85			
Whisky, brandy, etc. (50 per cent)	1 oz.	A small wineglass.	85			
Wines (8-25 per cent)	1 oz.	A small wineglass.	15-50			
Miscellaneous.						
Sugar	8 grms.	A heaping teaspoon.	33			8.
Honey	10 grms.	A heaping teaspoon.	33			8.
Olive oil	4 grms.	A teaspoon.	37		4.	
Olives	7 grms.	One medium size.	15		1.5	.5
Almonds, shelled	25 grms.	A heaping tablespoon.	165	5.	13.5	4.5
Cocoa powders	10 grms.	A heaping teaspoon.	50	2.	3.	3.5

DAILY FOOD DEMANDS.

Adult.	Body weight.	Calories per pound.	Total calories.	Total grammes proteid.
At rest in bed	150 lbs.	12	1800	72
Slight activity	"	15	2200	88
Light work	"	17	2600	115
Moderately hard work	"	20	3000	120
Very hard work	"	23-30	3500-4500	140-180
Child.				
Age 0-6 months	7-15 lbs.	42-40	300-600	1 gramme per lb.
6-12 "	15-20 "	40	600-800	35-40
2 years	25 "	36	900	42
4 "	35 "	34	1200	55
8 "	50 "	28	1400	60
12 "	75 "	22	1600	75

1 gramme proteid = 4.1 calories.
1 " carbohydrates = 4.1 "
1 " fat = 9.3 "
1 " alcohol = 7.0 "

*These tables can be obtained on a small folding pocket card from F. H. Thomas Co., 691 Boylston St., Boston.

value than the one habitually used, but with bulk enough to be satisfying and variety enough to be pleasant. It enables us to easily compare the different kinds of soups, fish, meats, vegetables, fruits, and desserts, and to choose those of lower food value.

Compare a cup of clear soup (10 calories) with a plate of thickened soup (160 calories), a heaping tablespoon of cod (35 calories) with an equal amount of salmon (105 calories), a slice of lean meat (70 calories) with a slice of fat meat (200 calories). Compare green vegetables, such as lettuce, spinach, tomato, celery, cucumber, etc., which have a food value so low that they have not been charted (about 100 calories per pound, most of which cannot be used by the body), with starchy vegetables like potato, rice, corn, and peas (35 to 40 calories per tablespoon). Compare an apple or pear (75 calories) with a saucer of figs or dates (350 calories). Compare an orange (70 calories) taken for dessert with 4 tablespoons of ice cream (540 calories).

We can see the need of limiting the amount of foods which have high value in small bulk, such as bread and butter, olive oil, cream, sugar, cereals and cheese, while weak foods such as oysters, beef tea, greens, etc., need no restriction.

Summary.—The object of White's paper is to emphasize the importance of the amount of food as well as kind, and to help make the dose of food as easy to understand as the dose of medicine. The principles of nutrition are better known than the way to apply them. Our use of foods has been much less accurate than our use of drugs, and dietary mistakes have been common through ignorance of food values or difficulty in estimating them. A large part of the difficulty for the busy doctor has been the amount of work needed to estimate the fuel value of a day's food or the amount of carbohydrate, proteid, or fat in it. The method of doing this must be simple to be freely used.

This simple diet card has been offered as an aid in applying our knowledge of the principles of nutrition in our daily use of foods. Its chief value is its convenience. Extreme accuracy is not possible or necessary, and the author's aim has been simplicity rather than completeness. Its object is to avoid weighing of food and tedious calculations by giving food values in household measures.

By its use we can readily plan or estimate the value of any simple diet or control the amount of some one food material, such as the carbohydrate in diabetes or the proteid in nephritis.

It helps to overcome the old excuse that food values are hard to get at, and its greatest use is in educating the doctor in the value of the foods he has ordered and as an introduction to more accurate dietetics.

POSTURE OF THE LYING-IN PATIENT.

MOSHER in the *American Journal of Obstetrics* for October, 1911, discusses this question and says that his own method has grown from the observation of 2700 cases of labor seen in private practice, and in the clinic, in an experience of twenty years. He was taught as a student to have the woman on her feet the tenth day. This rule was *ex cathedra,* and admitted of no discussion. It is no doubt of good average limit, for those mothers whose circumstances compel them for economic reasons to early resume their responsibilities regardless of future conditions of the pelvic organs.

In recent years, however, he has found that all women are not given the same recuperative powers after labor any more than all men are created free and equal, two arguments which are based on wrong premises.

The number of women who have prolapsus and retrodeviations taught him, he asserts, that there was a cause for such conditions. He attributes these conditions to relaxation and subinvolution, which he believes is benefited if not cured by rest in bed during the time lochia rubra persists. Consequently he made a rule years ago that the woman should be on her feet when she can have a record of two days in which no red color is shown. This puts the average

patient up about the fifteenth day. She walks to a chair, is up an hour, increases the limit daily, as she shows her recuperation, judging by the lochia and height of the fundus. He examines her the fourth week, and cautions her to lie down a part of each day through the sixth week. He has had the fundus at the brim by the ninth day, and the lochia serosa at the same time, and has had the patient in bed eighteen and twenty days. Usually she may be up half the day the third week, and out the fourth week, but he finds a routine practice during the first ten days of raising the head of the bed 8 or 10 inches an advantage in assisting drainage without subjecting the patient to any effort or exertion as is done when on the back rest. Our American women of the better class are not to be compared with the German peasantry, so that conclusions drawn from hospital statistics of the latter class cannot serve as a criterion for us in putting the patient on her feet. On the other hand, the modern young mother of the present generation who has had an education and an opportunity to live the normal life under direction of her adviser will be found to come through her ordeal in better shape by the adoption of the conservative rule than if she followed the heroic teachings of our brothers across the sea.

As to the change of posture in bed, the experience of the writer has led him to allow the patient to be turned on her side after the first few hours; this gives her a sense of comfort after the long-enforced cramped position on her back with her knees flexed, as she was during labor. The writer asserts he has never been unfortunate enough to see a case of embolism following labor, but appreciates that one is never too old to learn.

A vexed question as to the lying-in has always been that of the emptying of the bladder. His early teaching was in case of laceration requiring repair to put a binder around the knees, and always catheterize. In the light of present-day methods, this plan is inexcusable from any point of view.

His students are instructed to make the catheter a last resort. The patient is to be urged to use the pan while lying on her back, with various devices of pitcher, douche, water poured from height into a vessel or from a faucet, to aid by suggestion the emptying of the bladder. If these expedients fail, she may be turned gently over on her face, lying across the pan to aid by gravity the expulsive effort. Then as a last resort, rather than to catheterize, she is, if the pulse is ninety or under, allowed to be helped out to the jar, which, giving her the upright posture, usually accomplishes the desired result. Contrasted with his early teaching when the patient was kept on her back for voiding the urine, and the catheter passed under the sheet to avoid exposure of the person of the patient, the German practices are revolutionary.

The question then is one in which there has been room for great divergence of opinion throughout the history of midwifery practice. His friend, the late Dr. Theophilus Parvin, whose writings he considers to rank with those of Charles D. Meigs, and Sir Thomas Watson, as examples of medical classics, quotes Sydenham, whose wise observation taught him that in the case of those who died after childbirth the result was in many instances from getting up too soon—that is, before the tenth day. The axiomatic statement of Dr. Churchill, the famous obstetrician, was that for one evil result from error in diet he had seen ten from assuming an upright attitude or too early leaving the bed. Dr. Parvin closes his argument with the advice that it is better to keep a woman a week too long in bed rather than to have her up a day too soon. The condition of the woman is a better criterion than the number of days after labor. While sitting up in bed may be permitted for most patients during their meals after the third day, it is better that the puerpera remain in her room at least three weeks.

So while a number of men who have favored a policy of extreme rapidity in the putting of their patients on their feet have been able to produce arguments which, if always based on facts, must be very convincing as to the individual instance, still,

on the other hand, the majority of the profession during all the ages adhered to the more conservative method. The author would therefore make a plea for more uniformity in teaching the subject of posture in the puerperium, basing the conclusions on his own experience as well as on the observation of obstetricians in our great maternity hospitals, as to the effect on these cases as regards involution and recuperation where the two extremes are practiced.

In the meantime, the rule to be laid down from the present state of knowledge is that the involution of the uterus, the color of the lochia, and general condition of the individual patient must govern the conduct of the case, rather than an arbitrary time limit based on the number of days following delivery.

THE CURE OF ECLAMPSIA.

In the *British Medical Journal* of October 2, 1911, TWEEDY insists that all toxemic patients should be treated as eclamptic, even though they have not developed fits. The lateral position must be insisted on for the removal from the throat of mucus. Inhalation of oxygen and artificial respiration should be undertaken whenever the patient shows any sign of respiratory obstruction. Food of any kind is deleterious, and should be withheld for long periods after consciousness is regained.

On admission his patients were given ½ grain of morphine hypodermically; the stomach was washed out, and a purgative poured through the tube. There is no importance attached to the nature of the purgative; it must be efficient.

Formerly one to one and a half pints of fluid were left in the stomach, but this has been omitted latterly, as occasionally it was found to regurgitate into the mouth, and the plan was also open to the fear that by its weight and position the fluid might embarrass the heart. After the stomach is washed out the catheter is passed and the urine withdrawn, measured, and examined. The patient is then turned on her side, and the rectum and lower bowel thoroughly washed out with a solution of sodium bicarbonate through a long rubber tube. If an enema has been given immediately on admission it will have some effect in softening fecal masses, and will probably make subsequent rectal washing more effective. Lavage must be very thorough; a pint to a pint and a half of fluid is used at a time, and the procedure continued till a large amount of fecal matter has been washed out. Gallons of water may have to be used before these masses are sufficiently softened. When once the bowel is cleared one to one and a half pints of a solution of sodium bicarbonate (one-half drachm to a pint) is left in the rectum.

If in spite of this the urine remains scanty, submammary infusion of a similar solution is practiced; these injections may amount to from 1 to 2 pints.

Saline solution was formerly employed for the purpose, but the fear that salt would add to the difficulty of elimination caused the substitution of plain water, which in turn was finally discarded, because of the theoretical fear that laking of the blood would result. Linseed-meal poultices to the loins help to increase renal activity; they are to be changed every three hours. Mucus that forms in the mouth falls into the cheek and is to be wiped out with moist cotton-wool. It is a great mistake to wipe mucus from the pharynx, particularly when it requires the introduction of a gag. Such manipulation irritates the patient to quite an unnecessary degree, and is one of the many causes of spasmodic choking.

Tweedy says it is a grave error in treatment to leave the patient in the charge of one or two inexperienced nurses. They cannot be trusted or even expected to take the initiative in resorting to measures to restore an asphyxiated patient. A medical man should always be in attendance. This is frequently a difficulty, but must not be considered an impossibility by those who realize its importance. If mucus forms in the throat and spasm of the glottis occurs, the attendant is instructed to draw the patient's head and shoulders over the side of the bed and at the same time to turn the face down toward the floor. This can be

facilitated by grasping the hair. It is immediately followed by an outpouring of bloody mucus from the nose and mouth, with rapid relief of symptoms. Oxygen and artificial respiration are important aids in the reëstablishment of breathing.

The patient is disturbed as little as possible for twelve hours, although if the bowels have not moved treatment is persisted in every eight hours to effect this. The catheter, too, is passed every eight hours. Morphine, beginning with ½-grain doses and followed by ¼-grain doses every two hours, is given whilst the fits persist until 2 grains have been administered within twenty-four hours. At times doses as moderate as these produce surprising slowness of the respirations. When they fall to six or seven per minute it is an indication that enough morphine has been given. Atropine or scopolamine may with advantage be substituted, together with artificial respiration. Should consciousness be restored sufficiently to permit of swallowing, the patient is encouraged to take frequent draughts of hot or cold water, but until recovery is complete all forms of nourishment should be withheld.

As to the lines of treatment to be avoided:

Accouchement forcé comes first. Many patients recovered from eclampsia and carried their children for considerable periods afterward. While labor occurring during the seizures is not pleasant, yet should it do so, the os rapidly dilates. When fully dilated, delivery may be expedited with forceps, but as a matter of fact the application of forceps is seldom found necessary. Delivery is usually easy, and there is considerable difficulty in conducting an aseptic artificial delivery in these cases; for this reason, if for no other, spontaneous delivery is preferable. A patient should not be permitted to die undelivered, and if death threatens, vaginal Cæsarian section should be performed.

Vapor baths and other means to promote diaphoresis are obviously improper procedures. Eclamptics are suffering from paucity of fluid in the circulation, and this in spite of their tissues being possibly solid with edema. What is greatly wanted is a less saturated condition of the blood, and it is impossible to suppose that profuse sweating can have any other action than to increase this abnormality. Only a minimum of toxins (if any) can be eliminated by sweating.

Chloroform is closely associated in its effects on the liver and other organs with the eclamptic poisons. Tweedy asserts he has long learned to dread this anesthetic in all toxemic conditions. Stroganoff, however, thinks that his patients benefit by the quiet induced with very small doses of chloroform (12 to 15 drops) during any manipulative interference, and if by this dose he facilitates the passage of the stomach tube, or lessens the struggle during submammary infusion, he has achieved a great advantage at a cost which cannot be thought excessive. Tweedy asserts that had he known of Stroganoff's method, it would certainly have been tried by him. It will not, he thinks, materially alter statistics, but it should be remembered as a possible aid to treatment.

CATCHING COLD.

In the *Australasian Medical Gazette* of September 20, 1911, ROBERTSON writes on this somewhat homely subject and says his treatment may be divided into preventive and curative. Preventive treatment could consist in the avoidance of all those predisposing and exciting causes which can be controlled. Abundance of fresh air and exercise, avoidance of exposure to cold and wet, especially wet feet, moderation in eating, and the wearing of clothing suited to the temperature should be insisted on. The author believes that sleeping in the open air is a great preventive of colds. Any nasal abnormality should be rectified. He asserts he is constantly seeing patients who were regular sufferers from cold who completely lost that tendency on the establishment of normal conditions in the nose.

What are we to do when a cold threatens? Unfortunately one does not see the cases in

that stage, but there is no doubt many attacks might be aborted if taken in time. Put the patient in bed, give a brisk purgative, calomel at night followed by a saline in the morning. Ten grains of Dover's powder with hot lemonade, and a hot-air or poor man's bath act most beneficially. The latter is an excellent substitute for the more elaborate hot-air bath. Half a dozen soda-water bottles are filled with hot water, enclosed in socks and placed alongside the patient, who speedily responds with a generous perspiration. Opium, in one of its forms, preferably with belladonna, is one of the best remedies to abort an attack. Ten minims of tincture of opium with spiritus ætheris nitrosi and liquor ammonii acetatis every few hours gives excellent results. The author has tried oil of cinnamon in 5-minim doses with a drachm of olive oil in an emulsion, and is satisfied that it acts effectively. Unless well diluted it causes heartburn.

Camphor, belladonna, and quinine in combination have a great vogue in the United States, the dose being gr. ½, gr. ⅛, and gr. ½ to gr. 1, in that order. It must be pushed until dryness of the throat is felt.

Locally inhalations of benzoin vapor or benzoin and menthol vapor give considerable relief. Possibly nothing gives more relief than a spray of cocaine, but it is well to be very careful with the drug, as if it is left in the hands of patients the habit may be formed. If the condition is not relieved within twenty-four hours the nose may be sprayed frequently with oil of cassia, oil of sandalwood, 5 minims in 1 ounce of liquid vaselin, or a combination of camphor and menthol with oil of eucalyptus and oil of cinnamon is effective. Various snuffs are recommended, but the author asserts he has received less benefit from them than from sniffing up powdered boracic acid. It stings for a moment, but speedily induces a copious watery secretion, with reduction of the tumidity and stuffiness.

When the mucopurulent stage is reached considerable comfort will be obtained by washing out the nose with an alkaline lotion, composed of baking soda, borax and sugar, or simple saline, after which the free use of the atomizer has a soothing effect. The excoriation of the nares may be relieved by the use of lanolin or witch-hazel cream. The addition of witch-hazel to the alkaline lotion is beneficial for its astringent effect.

At this stage tonics in the shape of quinine and iron are indicated with a generous diet, and if convenient a change of surroundings.

Finally, the author asserts he has had some startling results in all stages of cold, acute or chronic, by the use of a stock vaccine of the micrococcus catarrhalis. No doubt an autogenous vaccine would be better, but the other is available at once. He has seen an acute cold aborted by 125,000,000 in six hours, and he has had a subacute case with involvement of the ears and marked deafness lasting three weeks, and resisting all other treatment, get quite well, with normal hearing, in two days. He has also had complete failures where no result at all was shown. That is easily enough understood. Though he has spoken of this remedy last, he believes he should put it first, since if it acts at all it acts promptly, and no other treatment is necessary. Further, the rationale of its use appears to him more scientific and more in accord with modern knowledge.

In infants the condition may become serious owing to the interference with nutrition, or the infection may be spread to the bronchi, setting up capillary bronchitis. He remarks here that care should be taken to differentiate between a simple nasal catarrh and a specific catarrh. Usually in syphilis there are other symptoms, such as rash, condylomata, fissures and cracks round the anterior choanæ, etc., to guide one. Further, the child usually looks syphilitic, with dry skin and old appearance. There is usually some difficulty with the feeding, as the child cannot suck and breathe at the same time. It may be necessary to spoon-feed. The child should be kept in an equable temperature and great care exercised in cleansing the nose. Whilst the child's head hangs over the nurse's

knees a warm alkaline lotion may be dropped into the nostrils and the nose "stripped" between the finger and thumb. This not only expresses the accumulated secretion in front, but aspirates that at the back. After this has been done a few times a drop or two of liquid vaselin should be instilled into each nostril. Robertson says it is wonderful what an amount of relief this will give.

BILIOUSNESS.

FENWICK, writing in the London *Practitioner* for October, 1911, has this to say of the treatment of biliousness: The diminished functional activity of the biliary and pancreatic secretion necessitates the careful selection of a dietary. Excess of starchy material should be omitted in favor of partially predigested cereals and sugars, and consequently toast is to be preferred to bread, and the various pancreatized and malted foods to oatmeal, tapioca, or sago. Potatoes do not disagree during the earlier stages of the complaint, but uncooked green vegetables and fruits always produce flatulence. Owing to the usual existence of hyperchlorhydria, milk is readily digested when diluted with lime-water, and from two to three pints may be allowed during the twenty-four hours. Cream is often distasteful, and fresh butter may be digested with difficulty. Lightly roasted beef and mutton may be allowed once a day, while pigeon, chicken, game, white fish, tripe, sheep's brains and sweetbreads are good substitutes for the less digestible forms of butcher's meat. Veal, pork, and meat fat must be avoided, and bacon and ham be tried with caution. Eggs are particularly injurious in many cases. Alcohol in any form is apt to produce acidity, but sometimes a little white wine diluted with soda water appears to stimulate appetite. Tea usually disagrees, but coffee with milk or cocoa made from the nibs or husks may be taken with advantage.

The various artificial preparations of the pancreas, such as the emulsion, the glycerin extract, pancreatin or the keratin-coated pill, should always be given a trial in advanced cases, but the liquor pancreaticus is of doubtful value. The extract of malt may also be employed with advantage in some instances, or taka-diastase may be prescribed before meals. When emaciation is a marked feature of the case, cod-liver oil or the petroleum emulsion occasionally appears to exert a favorable influence upon nutrition. When there is reason to believe that gall-stones exist. olive oil should always be given a trial, a sherryglassful being administered each morning before breakfast. Unfortunately, many people find this treatment very distasteful, and under these circumstances oleate of sodium may be employed with much advantage. According to the writer's experience the pill eunatrol (gr. 4) is of extraordinary value in all cases of chronic cholangitis, three pills being administered three times a day before meals and the treatment continued for three months or longer. Many apparently hopeless cases entirely regain their health by the use of this simple remedy. In other instances the pill cholelith or a cachet containing ten grains of aspirin and eight grains of oleate of sodium taken between meals exerts a beneficial effect. The bowels always require careful regulation.

When gastric hyperacidity is a prominent symptom, a dose of sulphate or phosphate of sodium, Rochelle salt, Carlsbad salts, or some other simple saline, dissolved in a tumblerful of hot water and taken each morning before breakfast, is of the greatest value, but if subacidity exists, recourse should be had to a confection of sulphur and guaiacum, or to a pill containing podophyllin, creosote, and rhubarb.

In no disease is the employment of calomel and other mercurial preparations more abused, and it is highly probable that the daily recourse to calomel, which is such a common practice, produces extreme irritation of the duodenal mucous membrane. On the other hand, a dose of calomel or mercurial pill once a week, followed by a saline the next day, always affords temporary relief to the nausea and giddiness. During an attack of febrile jaundice, due to

acute cholangitis, the patient must remain in bed upon a bland liquid diet. A course of treatment at Carlsbad, Marienbad, or Harrogate often produces decided though temporary benefit. Tonics of all kinds are veritable poisons, and only alkaline mixtures should be prescribed to relieve the symptoms of the secondary gastric and intestinal indigestion. The question of surgical interference should be always considered when clinical evidence points to the existence of gall-stones, chronic pancreatitis, or duodenal ulcer.

FLATULENCE.

BURNET in the *Practitioner* for October, 1911, says that in most cases the diet will have to be carefully chosen and somewhat restricted. A rather dry diet will be found to suit best in nearly all cases—little liquid being allowed with meals. This excludes all soups and broths at the beginning of a meal and allows of only a small quantity of fluid toward the close of the meal. What the special drink should be has to be decided in each particular case. Some will do best with plain water, others may require a little stimulant—alcohol in some form.

We have to consider carefully in these cases whether alcohol is necessary, and if so what form is best. If given it should be prescribed with caution, more especially in the case of women suffering from dyspepsia, for oftentimes the temptation to seek temporary relief by its means from discomfort and flatulent distention, and the lassitude accompanying these conditions, is very great. From such beginnings a dependence upon alcoholic stimulants sometimes becomes established. If alcohol has to be given the amount should be clearly defined and given with or just after meals. Effervescing waters are often forbidden, but in the writer's opinion, if taken in strictly limited amount, they are helpful rather than otherwise, owing to the stimulus given by the gas they contain. The light white wines and clarets are of doubtful value, but sometimes a glass of dry sherry seems to aid digestion. Champagne is rarely required, but in some cases where there is much prostration it is useful for a time. Ales and stout are not as a rule well borne. No alcohol in any form should be given on an empty stomach.

Tea must be limited in quantity and must be freshly made. The stewed decoction called tea, so dear to the heart of the hospital out-patient, is a fruitful source of these digestive troubles and of the "spasms" so graphically described by the frequenters of hospital out-patient rooms. Distention and disturbances of digestion are not, however, by any means confined to the class of persons who come under treatment at hospitals, and as a source of flatulence the excessive use of tea amongst well-to-do people should be always borne in mind.

Animal food is, as a rule, best digested by these patients; it must be carefully selected and well, though plainly, cooked—under- rather than overdone; tender beef and mutton, chicken and other birds, game, and fresh white fish. Pork, veal, goose, duck, etc., should be forbidden. It will be often found best at first to limit the meat meals—luncheon and dinner—to practically one course, light tender meat and a little vegetable, with a biscuit and butter to follow. Much green vegetable will usually not be well borne, and what is given should be rubbed through a sieve—cooked as spinach is served. Often it is best to forbid potato for a time, and to substitute toast or second day's bread. Farinaceous foods have to be given carefully and the effect watched, but where digestion by the stomach is chiefly at fault starchy foods, as they are dealt with chiefly in the intestines, may be given in greater amount. The contrary holds good where digestion goes on best in the stomach; then meats are most satisfactorily digested. Ripe fruits have to be taken in great moderation, and raw vegetables, salads, etc., are not usually allowable in the earlier stages.

Whether meat preponderates in the dietary or farinaceous foods, the absolute necessity for slow eating and complete mastication of all solids should be strongly and repeatedly impressed upon the patient. It

is always well to ascertain the condition of the teeth, and not infrequently some repairs have to be carried out by the dentist before complete and comfortable mastication can be attained by the patient.

Nux vomica is one of the most useful remedies in these cases and it may be given in tincture, or in pill with a quarter of a grain of capsicum and a couple of grains of compound rhubarb pill. Bismuth is of use in many instances, with an alkali such as bicarbonate of sodium, and calumba or other bitter infusion. Salicin is not used so much as we believe it might be, and given in five- or ten-grain doses in water before meals is often very helpful. Pepsin seems distinctly indicated, but it is often disappointing, and at the best it must be looked upon more as a palliative than anything else. Pancreatin, too, does not give the relief in all cases that we should expect from it. Salicylate of sodium with liquor pepticus, nux vomica, and spirits of chloroform seems useful in a certain number of cases. Extract of malt given with or just after meals helps in those cases in which the digestion of starchy foods is obviously difficult. A few drops of dilute hydrochloric acid in water shortly after meals is often decidedly beneficial. In some cases iron and quinine seem to be indicated, and in many cases we prescribe them only to find how difficult it is to get them to agree, especially in the earlier stages. When improvement has set in they may be tried with more confidence. A pill which is often well borne consists of a grain of reduced iron, with extract of nux vomica, quinine, and pil. rhei comp. It acts as a tonic and also as a mild aperient. It may be varied by a grain of pepsin and a twentieth of a grain of arsenous acid in place of the quinine, and it is useful in anemic subjects. Calomel in very small fractional doses, given twice daily for a few days at a time, has often a very good effect, and where there is a sluggish action of the liver a grain or two of blue pill with the pill colocynth and hyoscyamus, or the compound rhubarb pill, should be given occasionally and followed, if necessary, by a mild saline in the morning, but anything like strong purgation should be avoided.

Where the distention is chiefly in the bowels salicylate of bismuth, beta-naphthol, and salol, in cachet, give at least temporary relief.

Lavage is not usually needed in the cases we are considering, but where there is much accumulation of mucus it is very helpful by clearing the stomach and thus giving a fair start to other treatment.

In acute attacks of flatulence hot water, with aromatic spirits of ammonia and spirits of chloroform with perhaps a teaspoonful of brandy, often relieves the tension and spasm. Sometimes a drop or two of oil of cajuput in mucilage has a very good effect.

In cases in which it is possible for the patient to follow such advice we may recommend riding on horseback or traveling, sea-bathing for young subjects, or a voyage, as the best means for completing the cure and preventing a recurrence of the symptoms.

THE BLOOD-PRESSURE IN DIPHTHERIA.

The question of what should be done to maintain blood-pressure in diphtheria has light thrown upon it by a paper of ROLLESTON appearing in the *British Journal of Children's Diseases* for October, 1911. He tells us that in a series of 179 cases of diphtheria the blood-pressure was found to be subnormal in 63 patients, or 35.1 per cent, the extent and duration of the depression having, as a rule, a direct relation to the severity of the faucial attack.

In the great majority the highest readings were found in the first and the lowest in the second week of the disease. The normal tension was usually reëstablished by the seventh week.

In a large proportion of convalescent cases either the readings in the recumbent and erect positions were the same, or the recumbent was higher than the vertical record until convalescence was firmly established.

In laryngeal cases disproportionately high readings were obtained, especially when the

dyspnea was sufficiently severe to require operation. Relief of the obstruction by tracheotomy was followed by an immediate and steep fall of blood-pressure (20 to 40 mm.).

The blood-pressure showed little tendency to be affected by the early serum phenomena, but during the late febrile syndrome it was raised in 40 per cent.

Albuminuria was accompanied either by a fall or by no change in the blood-pressure, except in a case of uremia, in which there was hypertension.

In early paralysis the blood-pressure tended to fall. In late paralysis, even when extensive, it was usually not affected.

Sphygmomanometry in diphtheria, as in other acute diseases, though of considerable theoretical interest, has little practical significance.

Adrenalin therapy in diphtheria may favorably influence the other symptoms of suprarenal insufficiency without affecting the blood-pressure.

EXPERIMENTAL TUBERCULOSIS OF THE TESTICLE.

TYLINSKI (*Deutsche Zeitschrift für Chirurgie,* 110, H. 4-6) reports in detail his experiments with tuberculosis of the testicle in rabbits, and says that the possibility of the localization of tuberculosis in a previously sound testicle under the influence of a marked trauma is experimentally proven. The process localizes itself in the intercanalicular connective tissue. It can, however, spread to the canaliculi. The favorable influence of semen retained in the testicle by ligation of the vas deferens upon the localization of the tuberculosis has not been demonstrated. A tuberculosis already established in the testicle was in no way influenced by this storing up of semen in the testicle. The immediate spread of tuberculosis from one testicle to another through the seminiferous passages remains undemonstrated. The spread of tuberculosis of the testicle through the seminiferous passages in the direction of the stream has been demonstrated by the experiments of the author, but the spread of the disease against the flow of semen has not been established.

THE GALL-BLADDER AND BILIARY TRACT AN AVAILABLE THERAPEUTIC ROUTE TO THE UPPER BOWEL.

MATAS (*New Orleans Medical and Surgical Journal,* October, 1911) states that from his limited but very satisfactory experience since August, 1910, he prefers the infusion of fluids directly into the duodenum through a catheter whenever this is possible or practicable, rather than inject the gall-bladder so that the fluid may find its way to the bowel by the ducts. For this purpose he employs a ureteral catheter of the largest size, which is allowed to penetrate into the bowel for one-quarter or one-third its length. Where catheterization is not practicable after the abdominal wound has been closed, the slow instillation of fluids through a drain introduced in the gall-bladder in the cautious manner recommended by McArthur is the proper procedure, provided the presence of bile in the drain demonstrates the patulous condition of the cystic duct. In this way the McArthur precedure as applied directly to the duodenum becomes the analogue of the "Murphy drip" as applied to the lower rectum.

The advantages of direct catheterization over the simple instillation of fluid in the gall-bladder are the avoidance of pain from overdistention and the greater certainty of injecting the desired amount of fluid into the bowel at a given time. The fear of infection of the bile tract by the contact of the catheter with the duodenal contents is amply disproved by clinical experiences. Nowhere is absorption so active or so normal as in the upper duodenum. Whoever has had occasion to test the efficiency of the upper as compared to the lower (rectal) route as an avenue to the circulation must be convinced that this, in a physiological sense, is infinitely more efficient and preferable, whenever it can be made available for the purposes of the surgeon.

Matas notes that the effect of duodenal infusion in arresting the incessant and exhausting postoperative vomiting was most noticeable. He accounts for its prompt action by the supposition that the introduction of fluid into the duodenum and upper bowel in a steady stream starts an active peristaltic wave downward toward the jejunum, which tends to keep the stomach empty and free from bile and pancreatic secretion. Sometimes the fluid appears in the vomitus, thus washing out the stomach, but by the method of direct infusion with a catheter in the duodenum, the tendency of the fluid is always to flow downward rather than upward. The most noticeable effect, however, is the stimulation of renal secretion and the great increase in the urinary output which follows after the irrigation has begun. The steady flow of fluid into the upper bowel increases the fluidity of the intestinal contents, washing the bowel and favoring peristalsis with the expulsion of gases, which are an especially annoying feature in old jaundice subjects. The filling of the blood-vessels and increased blood-pressure is certainly a prompt and most gratifying feature of the procedure in exhausted and debilitated subjects.

The method again can be utilized to great advantage in introducing nauseating medicated solutions, as in hemorrhagic cases in which gelatin and the calcium salts are indicated. This is especially true when the oral and rectal avenues for their introduction are barred by vomiting or rectal irritability. Again, the cholecystduodenal route is an effective avenue for the administration of soluble food and nutrient fluids of all kinds.

The indications for the cholecystduodenal drip are especially in cases of obstructive jaundice associated with nephritis, probably incident to the toxic effects of cholemia. In such cases there is constant danger of urinary suppression.

As to technique McArthur is quoted as follows:

"In practically every case of operation for gall-stones the operator establishes a temporary biliary fistula, either of the gall-bladder or of the common duct, the purpose being to relieve the cholemia, cholecystitis, or cholangitis, by continuous drainage, in much the same way that a urinary cystitis is relieved. Such treatment has proved to be the most efficient yet devised. To hasten the cure, some have added to this simple drainage a daily lavage of the gall-bladder with an alkaline, mildly antiseptic solution. The loss of much of the fluid used for an irrigation, frequently observed during such a lavage, naturally suggested the idea of studying the effects of various fluids introduced into the duodenum. So striking have some of these been that I desire to call attention to them, as well as to urge their further study by surgeons. First, as a means of deluging the system with water, the temporary fistula can be utilized with surprising advantage. I have repeatedly injected such cases by a continuous irrigation of a warm sterile normal salt solution, 500, 1000, 3000 Cc. of fluid, first as an experimental observation, then as a means of flushing out the kidneys, or clearing up jaundice, or filling up the blood-vessels, and in one case even added dextrose as supplying the food calories most easily assimilable.

"In every gall-bladder drainage, a tube is inserted and is held in place by absorbable purse-string sutures, the latter inverting the gall-bladder wall in such a way that, when the tube is withdrawn, peritoneal surfaces come in contact and the fistula heals. These purse-string sutures make the closure of the gall-bladder around the drain practically hermetic for the first few days. To provide, however, against accidental leakage into the abdomen, some temporary protective drain, such as Bullitt, of Louisville, devised, is employed for added safety. If now, with such a tube, through which the bile has been flowing, thus demonstrating the duct as patulous, we connect the tube of an irrigator containing, for example, normal salt solution, the rate of flow being graduated not to exceed five to six drops to a second, and the pressure to be not more than 20 inches elevation, continuous flow into the duodenum can be established

and maintained without discomfort to the patient. Too rapid flow, or too high pressure, will quickly produce pain, simulating mild biliary colic, and might deter one from using this procedure if not cognizant of these facts.

"When large quantities of fluids have been thus introduced there has been observed a slowing of the pulse with a filling out of the vessels, a loss of thirst, a moistening of the tongue and skin, a surprisingly rapid increase in the urinary output (patients complaining of the frequency of the urination), and even edema of the feet in a patient lying on an inclined bed.

"In case of the gall-bladder drainage the patulous condition of the cystic duct can be determined after the insertion of the drainage tube before closure of the abdomen, by the use of a small glass syringe filled with sterile salt solution. When I have had to utilize common-duct drainage, I have never tried this procedure until the second or third day, by which time, if leakage occur, it finds itself confined to the space walled off by the prophylactic gauze inserted for such emergency, and escapes externally."

SPLENECTOMY.

McCoy (*Journal of the Medical Society of New Jersey*, October, 1911) reports four cases. In two cases followed for many months after the operation the health has been perfect, nor has the blood shown any abnormality. A faint underlying bronze hue is noted over the skin of the entire body, resembling the early stage of hematogenous jaundice or pernicious anemia. The bone-marrow assumes increased activity immediately following the operation. There is an immediate increase of white blood cells and a diminution in the number of red cells; an increase in the number of eosinophiles and a disproportionate and more persistent diminution in the hemoglobin. The author notes that diagnosis of contusion of the spleen causing an enlargement of the organ from intracapsular hemorrhage can only be made upon the previous history of trauma. There is no symptom characteristic of the condition, nor would it be possible to differentiate from a tumor of the spleen due to other pathological changes, which might have been present prior to the injury.

A patient showing a tumor and evidencing pain in the splenic area following trauma in this region, particularly if accompanied by abdominal rigidity, should be carefully observed for subsequent rupture of the spleen.

The diagnosis of rupture of the spleen is difficult, whether the rupture occur at the time of injury or the trauma, or follow later because of the contusion. When rupture has occurred, the clinical picture does not differ materially from intra-abdominal hemorrhage due to rupture of other organs.

It is not always possible to differentiate between rupture of the spleen and rupture of the kidney. The pressure resulting from the accumulation of blood from a ruptured spleen may cause urinary symptoms closely resembling those found in rupture of the kidney.

In rupture of the kidney it has been noted in several cases that on careful rectal examination there could be distinctly felt an elevation of the posterior parietal peritoneum of the left side, due to the hematoma, which symptom is absent in splenic hemorrhage.

THE RESULTS OF TONSILLECTOMY.

Lothrop (*Boston Medical and Surgical Journal*, vol. clxv, No. 5) bases his statements upon data obtained from a series of 61 cases of enlarged tonsils operated upon at the Children's Hospital, Boston. The operation had been performed from one to three years prior to these observations. Of the 150 cases that were asked to report only 61 replied. The technique by which the tonsils were removed consisted in freeing the pillars from the capsule with Leland knives; the tonsil was then seized with a tenaculum and drawn inward, the pillars pushed back, and the remaining capsule dissected with a snare. In a few instances a straight knife and dissector were used in

place of the Leland knives. The patients left the hospital the day of the operation and no particular after-treatment was prescribed. Ninety-one per cent of the cases reported decided improvement in breathing. In 60 per cent of the cases there was absolutely no tonsillar tissue on either side. In no instance was there much of this tissue. Very few cases acknowledged having had any attack of sore throat after the operation, and these were mainly confined to those exhibiting some remnant of tonsil. Ten per cent complained of some dryness of the throat on waking in the morning. Ten per cent exhibited the scar of injury to the posterior pillars destroying the symmetry of the palate, but not interfering with the voice. Two uvulas had been injured. Nose "colds" had occurred once or oftener in about 21 per cent of the total number. The proportion was about the same in the two groups of cases with and without tonsillar tissue.

The percentage of postoperative hemorrhages was computed in the total number of cases operated upon in the past three years. During this time there were about 1700 tonsillectomy operations performed at this hospital. Two cases bled so that it was necessary to suture the pillars of one side. In a third case the pillars of one side were sutured as a precaution. There were no fatalities.

RENAL DECAPSULATION IN ECLAMPSIA.

EHRENFEST (*Surgery, Gynecology and Obstetrics,* September, 1911) on the basis of an experimental study states that he is forced to the decidedly disappointing but unavoidable conclusion that the value of renal decapsulation in desperate cases of eclampsia actually is based alone on the positive assurance of certain authors that they have seen patients recover after this operation who in their belief would have died without it.

It must, however, be emphasized that this skeptical attitude is justified only in relation to eclampsia. While apparently not exerting any noticeable immediate relief on diuresis—which is the all-important factor in the question of eclampsia—the operation possibly may create conditions favorable for the final restoration of structural lesions, not progressed so far that they are beyond the possibility of repair. The literature contains numerous reports which conclusively demonstrate an occasional favorable effect on chronic nephritic kidneys.

THE MERITS OF SUPRAPUBIC PROSTATECTOMY.

In a series of papers dealing with this topic (*Surgery, Gynecology and Obstetrics,* September, 1911) SQUIER describes his method of enucleating the prostate, which he commends because of its ease and rapidity and because the chance of damaging the ejaculatory ducts is lessened. One cause of fatality following prostatectomy stands out prominently, namely, pulmonary embolism. This has occurred in his work both after perineal and suprapubic operation. He does not believe that the means of approach to the glands has any very important bearing upon its causation. It has been stated that it is possibly more frequent after suprapubic prostatectomy, since the patient is confined to bed for a longer period, but this has not been the writer's experience. In two instances of death caused by pulmonary embolism, death followed in ten hours after a perineal prostatectomy, and in twenty-six hours after suprapubic. Another death from this cause followed perineal operation at the end of the fifth day. The factor which Squier does believe causative is severe vesical or rectal tenesmus, or anything which produces violent straining of the abdominal muscles, in this way forcing a clot into the general circulation. Therefore it is imperative to provide perfect drainage for the bladder and to guard against accumulations of scybalous masses in the rectum.

The suprapubic is, on the whole, a simpler operation than perineal prostatectomy, and men all over the country attempt it where they would not a perineal. There

will be a great many patients operated upon who are poor risks at best, and the combined mortality of the suprapubic operation will be larger than the perineal.

He believes that if prostatectomy is performed either from above or below by surgeons whose experience is equal with these two methods of operation, the rate of mortality will be the same; with the greater number of operative failures, however, on the perineal side.

When it is proven that perineal prostatectomy has no mortality, it will become the operation of election. Surgically, it offers nothing which is not more easily and rapidly accomplished from above, a cure is less certain, and it lacks giving the knowledge which an inspection of the bladder imparts.

Young states that his first operations upon the prostate were by the suprapubic route, but that during recent years he has appreciated more and more that there are a group of cases that cannot be very satisfactorily treated by either perineal or suprapubic prostatectomy—cases of inflammatory median bar formation. Therefore during the past four years he has developed an entirely new procedure, the urethroscopic median bar excision by means of a special "punch" which he has used, with no deaths and with excellent results.

Belfield holds that perineo-urethral prostatectomy seems to possess the chief merits, and to lack the chief demerits, of the perineal operation. The median perineal incision, knife edge upward, opens the urethra at the apex of the prostate, behind the external sphincter (membranous urethra) and in front of the vesical sphincter. Even if the external sphincter should be partly divided, the cut is linear, and the surrounding tissues are not seriously damaged; thus the chances of permanent incontinence and of fistulæ are minimized. The absence of dissection, sharp or blunt, of the perineum reduces the percentage of obstructive cicatricial contraction, and of fistulæ; the rectum is not injured. The mucous membrane of the prostatic urethra is incised cleanly over the enlarged lobe or lobes, sufficiently to permit the lobe to be raised from its bed by the finger. The prostatic capsule and adjacent venous plexus are not wounded. The vesical sphincter is thoroughly stretched and even incised if distinctly fibroid. The frequent combination of a fibroid vesical sphincter with the enlarged prostate is sometimes forgotten; yet instances are recorded in which total suprapubic prostatectomy has failed to restore urination until the sphincter has been dilated or incised at a subsequent operation. Doubtless the incomplete evacuation of the bladder following prostatectomy is sometimes due to neglect to remedy this condition of the sphincter.

Syms advocates perineal prostatectomy as the method of choice when it can be satisfactorily employed, and by surgeons who can satisfactorily accomplish it.

THE END RESULTS OF OPERATIONS ON THE STOMACH AND DUODENUM.

SHORT (*Bristol Medico-Chirurgical Journal,* September, 1911) publishes certain conclusions drawn from a study of the records of all the stomach cases treated in the wards of the Royal Bristol Infirmary during the years 1902 to 1910 inclusive. The number of patients under consideration is 165, of whom 60 died, 30 were lost sight of, leaving 75 to be investigated. The great majority of these cases have a history extending over seven years since they left the infirmary. The outstanding feature of the whole study is the demonstration of the extraordinary value of gastrointestinal short-circuiting for ulcer of the stomach or duodenum.

Another remarkable feature in this study is the occurrence of so many cases diagnosed clinically as gastric ulcer, but presenting no signs of the condition on the operation table. This relates not only to five patients with severe hematemesis, but also to a dozen others, whose symptoms had been indistinguishable from those of genuine organic trouble. In two of them the stomach was notably dilated. The author naively remarks that an inaccurate

diagnosis makes no difference, because in these cases a gastrojejunostomy usually brings relief.

A third point of interest is the association of gastric ulcer, or symptoms of gastric ulcer, with movable kidney. It is noted that in one case the kidney was fixed twice without relief before the girl was finally cured by gastrojejunostomy. In another a patient two years after kidney fixation was admitted dying of perforated gastric ulcer. In the third case the nephrorrhaphy was completely successful for years, and then a gastric ulcer formed. Of the perforated gastric or duodenal ulcer there were 61 cases. In two no operation was performed, in one instance because diagnosis was not formulated, and in another instance because the patient was ready to die. In one the ulcer could not be found after prolonged search. These three cases all died. Of the remaining 58 ulcers closed by operation 26 died. There were 12 cases between seventeen and twenty years of age, and comparatively few after the age of forty. Of gastric pyloric cases 22 were males and 26 females; of duodenal cases four were males and two were females. Of the recovered patients 23 have been followed and 10 lost sight of. In these 23 two had a primary gastrojejunostomy performed and were absolutely cured and can eat anything without trouble. Two had the ulcer excised and the incision sewn up like a pyloroplasty. One is completely cured, and the other can take ordinary food, but thirteen months after the operation began to suffer from occasional pain after meals.

Of the remaining 19 only four expressed themselves as entirely well; two of these came in again for gastrojejunostomy. One of these was cured and the other improved. It is noted that in 85 per cent of the cases of perforating ulcer, the ulcer is not at the pylorus. In 52 per cent of the cases that come to operation for dyspepsia the ulcer is at the pylorus. Early operation, within twelve hours of perforation, saves about 80 per cent of the patients. Later operation is usually unavailing, but the results do not get very bad until the second day. The figures speak decidedly against lavage of the intestines. Nearly all the sufferers continue to complain of indigestion afterward, unless gastrojejunostomy be performed at the same time.

Of cancer of the stomach there were 33 cases, including 25 men and 8 women. The ages varied from thirty-nine to seventy-one, the great majority being between forty-eight and sixty.

Only in four patients was there a history of gastric troubles eighteen months in duration; usually the symptoms had come on within less than a year. Pain was always present, vomiting was usual, and anorexia and wasting were usually noted. Only three patients vomited blood, and in one of these it was eighteen months before admission. Obvious or occult blood in the stools was much commoner. A lump was felt in the abdomen in 19 of the 33 cases. One case sent out after a gastrojejunostomy, with a supposed cancer, has remained well for four years. Another patient subjected to pylorectomy for supposed cancer was demonstrated later, on microscopic examination, to be suffering from an inflammatory lesion. This man died of shock. In 20 cases the abdomen was explored and closed again. Of these seven patients left the infirmary and were lost sight of. Five others died within a month. No deaths seem to have been hastened by the operative intervention. Only one individual lived for more than four months; he survived for more than two and a half years with a huge tumor, which proved to be inoperable on the second attempt, after which he died. In eight cases gastrojejunostomy was performed. Two died of the operation within a few days. One patient not relieved was lost sight of. In the other five some had transient comfort. In four patients extensive resections were performed. Two died of shock within a few days.

Of 41 cases of gastric or pyloric ulcer, 20 patients out of 29 followed through were absolutely and perfectly cured and could take any ordinary food following gastrojejunostomy. There were no deaths from the operation.

Of duodenal ulcers there were five men and one woman. One was treated by gastroduodenostomy. The other five had a gastrojejunostomy performed. One died suddenly and unexpectedly on the sixth day. Three patients were perfectly cured and one was almost well.

There were seven cases of hour-glass stomach. Three were cured and one much improved, one not improved, and two died. Of cured patients one had a double gastrojejunostomy performed; another a gastroplasty of the constriction and a gastrojejunostomy of the distal pouch; and the third had a gastrojejunostomy of the proximal pouch.

Operation was performed on seven patients for hematemesis, this being the only indication. In two cases there was an ulcer present in the stomach. In five nothing abnormal could be found, from which it is clear that severe repeated hematemesis is not an evidence of gastric ulcer. Three of the patients had been treated for pain and a little vomiting; in the others there was scarcely any warning before the bleeding came on. With the exception of one recent case which has a persistent sinus after gastroduodenostomy all the patients were cured, though one has some nausea and a feeling of tingling in the scar. Five had gastrojejunostomy performed.

There was one case of congenital stenosis of the pylorus treated by pyloroplasty. The child did well for three weeks and then died for no apparent reason.

A tabulation of the reported cases is appended to this serviceable article.

THE SIGMOID IN RELATION TO PELVIC DISEASE.

BARRETT (*Surgery, Gynecology and Obstetrics,* September, 1911) emphasizes the fact that the intimate relation of the genital tract to the terminal reservoirs of the urinary and alimentary tracts permits of easy communication of disturbances, and pathologic conditions.

The sigmoid through its ready adhesions may, like the omentum, serve to wall in a genital infection and save the patient, after which it may through perforation serve as a means of escape for this infection and the resulting pus, or by reason of adhesions it may introduce new elements of danger through colon bacilli infection and bowel obstruction.

The symptoms of constipation, diarrhea, passage of mucus or blood, the presence of a sausage-like mass in the left iliac fossa, etc., should lead us more frequently to include the pathologic conditions of the sigmoid in our pelvic diagnosis, especially when there seem to be adhesions on the left side.

The associated sigmoidal conditions are undoubtedly primary, in many instances, as they are found in men, although adhesions here may be due to infections of the vas. They are very frequently secondary to the disease of the tubes, ovaries, and uterus, as they are frequently observed after definite infections of this tract.

An intra-abdominal investigation of pelvic disease should include inspection and palpation of the sigmoid, when with few exceptions left-sided and not infrequently right-sided pelvic trouble will be found accompanied by adhesions, obstruction, and kinking of the bowel, or evidences of traction upon the bowel or the tube or ovary, or both.

Every pelvic celiotomy should be undertaken with the possibility in mind of meeting conditions of the bowel, ranging from adhesions to thickening, diverticuli, obstruction or new growths. The extra hazard of intestinal surgery may be projected into almost any case of pelvic surgery, and the operator should be mentally and materially equipped to meet the emergency.

Adherent, thickened or inflamed appendices epiploicæ or other projections from the sigmoidal wall must be considered in the light of our present knowledge of diverticuli and diverticulitis, and not amputated with the thought only of checking hemorrhage, as a possible lumen may be encountered.

On account of the frequent adhesions of the sigmoid, cecum, and appendix to the

round ligament or the peritoneum, tube, or ovary near the round ligament, no round ligament operation should be undertaken unless these structures are rendered free for a sufficient distance so that no kinking may occur or undue traction be made upon the bowel.

This frequent pathological condition of adhesion to or near the round ligament is a strong argument against extraperitoneal shortening of the round ligaments.

The treatment of acute or chronic infections of the genital tract should include thorough elimination from the bowels, yet efforts in this direction should take into account the possible crippled condition of the bowel through inflammation, dilatation, sacculation, etc., due to the interference offered by adhesions, infections, and inflammatory masses of genital origin.

SURGICAL APPLICATION OF PATHOLOGICAL PHYSIOLOGY IN SHOCK.

SLOAN (*Cleveland Medical Journal,* September, 1911) states that we have now come to realize that death in shock is due to a lesion in the central nervous system. In comparing clinically the patient dying from a severe infection and one in the terminal stage of shock, it is well-nigh impossible to distinguish the two conditions. The only difference is that in shock the chromatin loss occurs mostly in small areas in the cell, while in infection the chromatin loss appears as if due to solution, giving the cell a more washed-out appearance. In regard to the question of blood-pressure this is of paramount importance, since the central nervous system withstands anemia very poorly. Strychnine is condemned, morphine commended; intravenous saline solution containing adrenalin is regarded as helpful, but not permanently so. The external compression suggested by Crile in the form of a rubber suit Sloan states has been abandoned, since the solution of the remedy for low blood-pressure came when new blood was introduced into the vessels. Blood does not leak through the vessels, hence when there is a large amount introduced the blood-pressure has to stay up. This increase will last several days. It can be demonstrated that when the vessels have completely lost their tone, the pressure can be kept up hours at a time by giving a dog a plethora of new blood. In this case there is hardly any vessel tone, the pressure really arising from overdistention. Crile regards the nerve impulses arising from trauma as the principal causative factors in shock. Laboratory data are quoted to confirm this conclusion.

Nitrous oxide is much less harmful in shock than ether anesthesia, as shown by Crile and Prendergast. The difficulty of distinguishing between shock and hemorrhage is pointed out. In severe cases morphine given in adequate doses is the first treatment, with abstention from anything but a cleansing dressing. The foot of the bed is elevated, peripheral bandages are applied where this is possible, running over the abdomen, on which is placed a thick pad of cotton. External heat is used and when needful intravenous adrenalin-saline solution, 1 to 50,000, may be tried. It is best not to give it faster than 500 Cc. in an hour. If the shock continues to progress we must transfuse the patient in order to save his life.

This is usually applied when the patient's pulse cannot be maintained below 140. The donors should be men, as the radial artery is larger. Lanky individuals have fewer anastomosing branches coming off the radial. It is stated that there is no danger of hemolysis when both donor and recipient are in good health. The possible presence of agglutinins may be disregarded. Novocaine 1:400 makes the best local anesthetic. After the injection of novocaine the part is massaged for a few seconds to spread the novocaine evenly. It is best to ligate each little branch coming off the radial so as to make the dissection bloodless, and one should use very sharp knives. The artery should not be tied until just before it is slipped over the vein. It may be necessary to dilate the artery with a mosquito hemostat smeared with vaselin. A vein is selected from the forearm of the recipient

just large enough to cuff over the largest cannula that the exposed radial will take. The vessels must be handled very gently, using no traction and keeping the anastomosis warm with saline solution. Vein-to-vein anastomosis is an easier procedure, but the blood flow is slower. The pressure in the donor's arm veins may be raised by using just enough compression above the elbow so as not to cut off the arterial pulse. The flow of blood should be noted every five minutes for a minute in order not to overtax the recipient's heart; for in case the blood flow is too rapid it may dilate. Acute dilatation is shown by respiratory distress, cyanosis, increase in pulse-rate, lessened pulse volume. On percussion the diagnosis is confirmed by finding the cardiac dulness enlarged to the right of the sternum. The remedy is to lower the feet and press several times over the chest to help to empty the heart. Continue the blood flow until the recipient's blood-pressure is raised 20 to 30 mm. Hg. or the pulse-rate falls with an increase in pulse volume, the compression bandages over the lower body having been gradually cut away and the patient's feet lowered. The blood flow must be stopped when the donor shows the first paling of the lips, which is best seen at the junction of the vermilion edge and the skin. It may take forty-five minutes' flow to cause this. If the patient is in bad condition it is better to transfuse and complete the operation at once.

Tincture of iodine is used to sterilize the skin, as it saves time for the surgeon and much discomfort for the patient. Nitrous oxide anesthesia causes the least damage. All tissues to be cut are blocked with novocaine 1:400 or cocaine 1:1000, just as though one were doing the operation under local anesthesia alone. The nerves are blocked as far centrally as possible. If nitrous oxide is not to be had the next best anesthetic in crushes of the legs is spinal anesthesia. After withdrawing 10 Cc. of spinal fluid substitute 10 Cc. of a solution containing 40 mg. of novocaine and two grammes of granulated sugar. The upper part of the patient's body is kept elevated 30 degrees for an hour after the injection. The block from the local anesthesia lasting for from twelve to twenty-four hours will be very valuable, for by this means the sensory stimuli can be entirely prevented from reaching the sensory nervous system. In shoulder injuries, if nitrous oxide is not at hand ether should be employed, together with blocking of the skin, muscles, and nerves as though the patient were awake. Injury in this region causes more shock in proportion than in the lower extremities. Injury of the arms can be managed by blocking the brachial plexus in the neck or in the axillary fossa. The pulse-rate and volume are indices for removing the pressure bandages from the lower part of the body: usually this can be done in twelve to twenty-four hours, and gradual removal is desirable.

Sloan states that in treating shock cases by the principles given above there is immediately apparent an enormous drop in mortality, and that they are now able to save 90 per cent of those who formerly died from crushes of the extremities. Intra-abdominal bleeding after trauma also has a much lessened death-rate when the diagnosis is properly made. It is held that death from shock will in the near future be the exception in well-organized clinics.

TREATMENT OF ACNE VULGARIS AND PRURITUS HIEMALIS.

GUNN (*Practitioner,* November, 1911) advises for acne vulgaris bathing the face at least twice a day with hot water and an alkaline soap, followed by copious douches of cold and preferably rain water. Cold cream he considers especially undesirable. He uses a colloidal sulphur which is readily suspended in water, has no characteristic smell, and is much less irritating to the epithelium than the ordinary forms. A sufficient quantity of sulphur is shaken up with distilled water and allowed to stand until the supernatant fluid just loses its milky tinge. It is then decanted off and is ready for use. It should be shaken well and applied to the face by means of a fine spray

as often as the skin appears unduly oily. One application may be allowed to evaporate, and the skin again sprayed and afterward dried with a very soft handkerchief or towel. He states that the comedone is best left alone. When prominent and disfiguring it may be gently expressed, using a comedo-extractor with a practically flat or very slightly rounded surface applied next the skin.

The important point in the treatment consists in utilizing the antiseptic and penetrating properties of alcoholic solutions of iodine, such as are now in vogue for sterilizing skin surfaces for surgical operations. He uses a one-per-cent solution of iodine in rectified spirit and has it prepared freshly in small quantities at intervals not exceeding one month. This solution does not contain potassium iodide. Its method of use is as follows: The skin, which must not have been washed for several hours previously, is freed from excess of sebum by wiping with a soft towel, and is then uniformly painted with the iodine solution by means of a fine camel's-hair brush. This causes a slight tingling sensation and some lacrimation when applied around the eyes if the lids are not kept closed. These feelings, however, are quite momentary; the spirit quickly evaporates, and the surface becomes quite dry. It is better done at bedtime, left on all night, and washed off in the morning. There is never any trouble with the pigmentation; a trace of ammonia in the morning wash helps to remove the remaining stains. A very slight congestion of the skin follows the application, and a little powdery desquamation and considerable inhibition of the sebaceous secretion result. The application can be repeated in about four days, but usually intervals of a week are sufficient, gradually increasing the intervals until the process appears completely under control. In addition the instructions given above are practiced.

In this condition it is not unwise to keep the skin always in a state of mild desquamation. With this in view soaps containing tar (whether wood or coal tar seems immaterial), sulphur, ichthyol, etc., may be used. From puberty until about thirty years of age plain supernatant fat soaps should not be regularly used. After the age of thirty years the soaps used should contain a minimum amount of uncombined alkali. The ease with which a soap lathers may be taken as a rough index as to the amount of alkali present. The use of a rubber sponge is of great value in emptying the sebaceous ducts of accumulated secretion. It should be used without soap and with very little water and drawn across the face until it adheres to the skin, and by traction and suction empties the ducts. The majority of the movements should be in a direction contrary to that of gravity, to prevent undue sagging of the skin in a downward direction.

Washing should always be done with hot water, followed by the application of cold, and the tonic and stimulating effect of the latter may be increased by utilizing one old beauty formula, the addition of sufficient tinct. benzoin simplex to give it a milky appearance. Frequent and thorough cleansing of the scalp with Hebra's soap spirit—sapo mollis ℥iv, spt. vini rect. ℥ij—followed by a sulphur and salicylic ointment or similar lotion, is usually effective. The following lotion has proved both useful and acceptable, and may, if necessary, be perfumed: Ac. salicyl., ʒij; ol. amygdal., mins. vj; spt. vini rect., ad ℥vj.

As to the treatment of pruritus hiemalis, an extremely stubborn case is recorded in which all treatment was unavailing until the salts of lime were administered internally. The patient was put on tablets of calcium lactate 15 grains three times a day an hour before meals. The condition grew worse for two weeks, but about the third week a decided change became apparent; the itching became distinctly less intense; the lesions due to the excoriation gradually healed, probably on account of the disappearance of the incentive to scratch. At the end of a further three weeks or month the condition was practically cured. The calcium was then stopped, and though once or twice during the winter the condition showed a tendency to reappear, especially

in frosty weather, a dose of 30 grains of the lactate taken at bedtime was sufficient to insure a good night's rest.

A REVIEW OF 1000 OPERATIVE CASES OF APPENDICITIS.

KROGIUS (*Archiv für klinische Chirurgie*, Bd. 95, Heft 4) reviews 1283 cases of appendicitis treated in the University Klinik in Helsingfors during the years 1901 to 1908. Of these 1033 were operative cases, 452 being operated upon in the acute stage and 551 in the interval. Of the acute cases there were 177 of diffuse suppurative peritonitis. In 129 the operation was done early before pus had formed, or when the cases were on the border-line between the serous and the suppurative stage. In the remaining 146 cases operation was done on account of circumscribed abscess or other complications. Most of the interval cases were operated upon because of recurring appendicitis, and the minority, though seen in the acute stage, were held for operation after the subsidence of the attack. The 250 cases not operated upon were for the most part mild cases in which an operation was considered unnecessary, and some were cases of diffuse peritonitis seen at such a late stage that operative interference was not justifiable. Of the cases operated upon in the acute stage, 39 per cent of those with diffuse peritonitis, 5 per cent of those operated upon early, and 18 per cent of those operated upon late, died; of the interval cases 10 per cent died.

This series of cases agrees with all other statistics in showing that appendicitis is most frequent between the ages of ten and thirty years of age. Only 49 cases were between fifty-one and sixty years of age, and only 12 cases between sixty-one and seventy years of age. The male sex is afflicted about twice as frequently as the female. The series offers no evidence of any especial frequency of the disease at any certain time of the year. In reference to the question of the part played by the fecal stone in appendicitis, it is observed that fecal stone was found in 18 per cent of the cases. It was found in 12 per cent of the chronic cases and 32 per cent of the acute cases. This seems to indicate that fecal stone is not necessary for the origin or further development of appendicitis, nevertheless it predisposes to a high grade of inflammation and consequent destruction of the appendix.

In accordance with the opinion held by Sonnenburg and many others that an acute attack of appendicitis is only a culmination of a chronic process in the appendix, the series studied by the author showed that in the great majority of cases appendicitis occurs in those persons whose appendix had previously been the seat of a disease process. In reference to the question of early operation it must be recognized that appendicitis is a treacherous disease which cannot be reckoned with. At the outset it is impossible to say what the further course of a case will be. Even when the symptoms appear to be mild the appendix may be on the verge of perforation. Therefore it is best to operate upon all cases as soon as a diagnosis is made. Although this is correct in theory, it is very difficult to carry out in practice, chiefly because the cases do not fall into the hands of the surgeon in the early stage. Of the dangerous complications the most important is diffuse suppurative peritonitis. This was the cause of 65 per cent of the deaths in this series. It is hoped that this complication will occur less and less frequently as early operation becomes more frequent.

Of the 177 cases of diffuse peritonitis operated upon, 109 recovered and 68 died. During the period covered by this series the mortality was reduced from 62 to 28 per cent. As the method of treatment throughout this time was the same, the reduction in mortality was due to the fact that cases are now submitted to operation earlier in the course of the disease than formerly. Of 146 cases which were operated upon at a late stage of the disease, intraperitoneal abscess in the right iliac fossa was found in 107 cases, pelvic abscess in 13 cases, right-sided subphrenic abscess in 6 cases, retroperitoneal abscess in

8 cases, pylephlebitis in 4 cases, obstruction of the bowel in 6 cases, and perforation of the duodenum in one case.

COMPLICATIONS FOLLOWING THE SUBMUCOUS OPERATION UPON THE NASAL SEPTUM.

ALEXANDER (*New York Medical Journal,* Oct. 14, 1911), after alluding to the fact that the submucous operation has almost entirely displaced all others for deflected septa and noting that the good results obtained fully justify its popularity, calls attention to hemorrhage and infection, which may both be so severe as to be life threatening. The ordinary oozing which occurs following the first incision is best controlled by the application of a piece of absorbent cotton saturated with adrenalin. The secondary hemorrhages are usually moderate. Infections are by no means rare. In an experience of over 400 cases he states that he has seen it occur in only 21. In character it may vary from the mildest amygdalitis to the most severe purulent meningitis and septicemia. Nor are acute otitis media and acute mastoiditis infrequent complications. He reports three cases of severe infection, two ending fatally in acute purulent meningitis.

THE TREATMENT OF PULSATING EXOPHTHALMOS.

ZELLER (*Deutsche Zeitschrift für Chirurgie,* Bd. 111, H. 1 and 2) says that pulsating exophthalmos is in the great majority of cases produced by rupture of the carotid artery into the cavernous sinus with resulting arteriovenous aneurism. This condition results in most cases from trauma, but it may be idiopathic. In 244 cases collected up to the year 1902, 160 were traumatic and 57 were idiopathic; of 68 cases collected by de Schweinitz and Holloway, from the year 1901 to 1907, 53 cases were traumatic, 14 idiopathic, and one of unknown origin.

As regards the treatment of pulsating exophthalmos, in which the manner of origin, the symptoms, the cessation of pulsation and murmur upon compression of the carotid characterize it as due to an arteriovenous aneurism involving the internal carotid artery and the cavernous sinus, the principles are as follows:

In order to favor a cure, and especially as a preparation for ligation of the artery, systematic compression of the common carotid upon the affected side should be carried out. By means of this compression the collateral circulation is established, the heart is accustomed to the increased work thrown upon it, and the test is made whether the patient is able to endure the elimination of the carotid. If cerebral disturbance is caused by this compression, treatment by ligature of the carotid is contraindicated. If good results are obtained by compression treatment, then the ligation of the internal carotid of the affected side, as near as possible to the base of the skull, should be carried out without hesitation. Double ligature should be put on the carotid and the vessel cut through. The external carotid should not be ligated, because such ligation does not protect against recurrence, and this vessel should be retained in order to afford a blood supply to the eye in case the ophthalmic artery becomes obstructed.

In debilitated subjects roborant treatment should be carried out, and, in the case of heart weakness, the heart should be strengthened as much as possible before operation. In patients of this kind, especially when over forty years of age, ligation should be avoided in the worst cases and should be carried out only when systematic compression of the carotid produces no cerebral disturbance. In strong young people and in children ligation can be carried out under local anesthesia. In idiopathic exophthalmos, in old people, and in cases in which arteriosclerosis is demonstrable or strongly suspected, the systematic compression of the carotid and the careful consideration of operative treatment are of special importance. In these cases, if no cerebral disturbance follows a prolonged treatment by compression, ligation may be carried out in spite of these contraindications.

After ligature threatening danger is to be combated by heart tonics. In case of recurrence after ligation of the carotid in mild, especially unilateral cases, when compression of the ophthalmic vein causes the murmur in the vessels to cease, resection of this vein may be done. In severe cases, especially bilateral ones with high-grade impairment of sight, ligation of the carotid inside of the cranium proximal to the point at which the ophthalmic artery is given off must be carried out. Before this operation is undertaken the patient's strength must be increased as much as possible. General anesthesia is necessary, and great care must be taken to avoid as much as possible the loss of blood. The operation in itself is very severe, but does not threaten any danger to the circulation in the brain. The ligation of both carotids is unqualifiedly to be avoided, as experience shows this to be very dangerous, and neither upon anatomical nor physiological grounds does it have any influence toward curing the condition.

TREATMENT OF HOUR-GLASS STOMACH.

HÄRTEL (*Archiv für klinische Chirurgie*, Bd. 96, H. 1) states that the surgical treatment of hour-glass stomach consists either in the radical removal of the stenosed portion by resection, the artificial widening of the narrowed portion by plastic operation, or affording a passage by means of gastro-anastomosis or gastroenterostomy. Resection is in almost all cases unusually difficult on account of numerous adhesions, especially in cases complicated by ulcer. In the author's series resection was performed in 10 cases of benign hour-glass stomach and in three cases of carcinoma of the stomach.

Of the benign cases six were cured, two improved, and two died. In the two fatal cases operation was carried out with the greatest difficulty, and the liver, colon, and pancreas were involved in the operation on account of the adhesions. Of the three cases of cancer, one was cured, one died later of recurrence, and one died immediately following the operation. Gastro-anastomosis was performed in four cases.

The indications for gastroenterostomy are a large sac at the cardiac end of the stomach, marked adhesions which render resection difficult, and coexisting stenosis of the pylorus. This operation was done on three cases, all of which were cured. The best incision is the median one, which may in case of necessity be extended by a transverse incision through the left rectus.

HYPERTROPHIED PAPILLAE OF MORGAGNI CAUSING RECTAL SYMPTOMS.

MAGAREY (*British Medical Journal*, July 8, 1911) defines the papillæ of Morgagni as small, white, glistening projections, pyramidal or triangular, with the apices directed upward and inward toward the lumen of the gut, varying in number from one to six and situated either at the upper extremities of the columns of Morgagni or on the edges of the valves intervening between the upper ends of these columns, their length varying from one-eighth inch to one-third inch. They consist of myelinated and non-myelinated nerve fibers, with a considerable number of ganglion cells and very little connective tissue. They are covered by a stratified epithelium. When hypertrophied, the papillæ much resemble in shape and size the writing end of an ordinary lead-pencil. They must be distinguished from the small fibrous polyp that sometimes forms on the top of an internal hemorrhoid. They are regarded as accessory sense organs aiding and warning the anal sphincter. They are absent in the majority of patients. If hypertrophied they greatly augment pruritus—indeed, may be its sole cause, since this symptom is immediately relieved or cured by cauterization or removal. They cause pain, which may be located in the lower part of the back, or may be paroxysmally intense when the bowels are moved, passing off immediately thereafter. These symptoms are entirely relieved by cauterization. In some cases they cause a sensation of a mass in the rectum.

Cauterization is usually preceded by insufflation of an analgesic powder. A Kelly speculum is introduced into the rectum, and then withdrawn until the papillæ stand up at the inner end, when they can be successively touched with the electric thermocautery. One application is generally sufficient.

OPERATIVE TREATMENT OF FRACTURES.

Von Saar (*Archiv f. klinische Chirurgie,* Bd. 95, H. 4) reports the treatment of eleven cases of complicated and infected fractures of the extremities by means of operative treatment. Of these cases eight were cured, in two the results were unfavorable and amputation was performed, and in one the result of the operation was unfavorable and death occurred. The method of treatment consisted in enlarging the skin wound, laying free the ends of the fragment, turning them out of the wound at an angle of 60 to 90 degrees, and fixing them temporarily in this position. The wound was then cleansed, bone splinters removed, and the fragments wrapped up in moist gauze. The cavity in the soft part was then tamponaded with balsam of Peru. Dressing was done daily until all inflammatory reaction had disappeared and the wound had begun to granulate. Then the bone ends were replaced by means of extension or resection, held in place by a plaster cast, and further treatment carried on according to the usual method. This plan of treatment is suited to those cases of severe infection of the extremities in which the local condition appears to be unfavorable to the usual methods of treatment, or when under the usual treatment the inflammatory reaction shows a progressive tendency. This plan of treatment must not be undertaken too late, or until symptoms of general infection supervene. By means of this method it is possible to save extremities which under other methods of treatment would have to be amputated.

REVIEWS.

Serum Diagnosis of Syphilis and the Butyric Acid Test for Syphilis. By Hideyo Noguchi, M.D., M.Sc. 14 Illustrations. Second Edition. J. B. Lippincott Company, Philadelphia and London. Pp. 238. Price $2.50.

The first edition of this work was reviewed in this journal May 15, 1911. At that time the general purposes and plans of the work were fully discussed; we heartily commend the publication, and now congratulate the author upon his opportunity to present a second edition within a year.

The present volume is by no means a reprint. The first nine chapter headings are identical with those of the last edition, although much new matter has been intercalated and considerable additional detail incorporated, thereby greatly enhancing the value of the publication. The earlier chapters of the work, dealing with principles upon which the practical application is based, are but little altered—in fact, the first thirty-four pages are essentially identical in the two editions. Each succeeding chapter, however, shows numerous alterations, many of which are highly important. Chapter XII, dealing with the effect of treatment upon the serum reaction of syphilis and embracing nineteen pages, is new. Concerning the administration of arsenobenzol Noguchi concludes that the intravenous injection of an alkaline solution is the best procedure and the subcutaneous administration the worst (p. 146); the intramuscular injection is less effective than the intravenous. Although, during treatment, positive reactions frequently become negative, the average of negative reactions in the cases studied by Noguchi was only 33.7 per cent. In cerebrospinal syphilis the reaction becomes weaker, but does not disappear. Salvarsan influences the symptoms more promptly than the reaction. In promptly cured cases the reaction disappears in from two to five weeks, although

it may remain positive much longer. In 102 cases studied there were 10 relapses; recurrence could always be detected by return of the reaction, which was diminishing until relapse occurred. One patient had a second relapse.

The appended glossary remains the same as in the first edition; the bibliography has been more than doubled. The quantity of new matter may be appreciated by the fact that the present volume contains 65 pages more than the first edition. The closing paragraph of our review of the first edition may with propriety be applied to the present: "For the purposes for which the volume was written it may most cordially be indorsed, and in addition it should be read by all those interested in the practical applications of our knowledge of immunity to diagnosis and to treatment."

W. M. L. C.

CASE HISTORIES. By Richard C. Cabot, M.D. Second Edition, Revised and Enlarged. W. M. Leonard, Boston, 1911. Price $3.00.

Those who are familiar with the first edition of this book will recall that it was gotten up on a plan hitherto not employed. The author selects 100 case histories which he thinks well describes this number of typical cases in general medicine, covering the infectious diseases and diseases of the gastrointestinal and urinary tracts, diseases of the circulation, respiratory system, the nervous system, etc. The final chapter has been entitled "Notes on Drug Therapy," and is designed to provide information which the histories of the individual cases lack. Judging by the rapid sale of the first edition, the book has met a want of the medical profession. Dr. Cabot is so well known as a careful clinical observer and accurate recorder that full confidence can be placed upon many of the opinions which he expresses.

In looking over the list of medicines used in the medical wards of the Massachusetts General Hospital, which is found on page 279 under the heading of "Drugs Believed to Have a Specific Action in Relation to a Particular Disease," we note with considerable interest that pancreatic extract occupies this position, in the mind of the author, in certain types of pancreatic disease. This is a very general statement. If employed as a digestive agent when pancreatic secretion is lacking, there can be no doubt of its efficiency, but in the important diseases of the pancreas we believe that it has proved of little value. Under the title of "Drugs Designed to Improve Circulation and Remove Edema," we note with hearty accord the statement that the tincture of digitalis employed should be physiologically tested. That pilocarpine is a good remedy for this purpose we think is very doubtful. It certainly never improves the circulation, and it is unsafe in edema in cardiac disease. We are much interested to learn that strychnine, "though doubtless used too much," has, in the opinion of the author, "stood the test of time as a heart tonic in fevers and neurasthenic states." This is a statement which we think requires qualification. A few doses are often useful, but when continued over a long period of time we believe that strychnine is harmful when given in the manner in which Dr. Cabot recommends it.

A MANUAL OF PHYSIOLOGY. By H. Willoughby Lyle. Oxford University Press, 1911. Duodecimo, xvix, 747 pp.

This little book contains a large amount of information in a small space, and the material is well up to date. In most respects the more recent additions to physiological knowledge are given a place in this manual, and in all instances this has been done carefully, avoiding the patched appearance which some manuals acquire with the progress of science.

The arrangement of the book does not seem satisfactory from a pedagogical standpoint. It begins by describing an ameba, and follows with cytology, chemistry of the foodstuffs and enzymes before taking up diet and digestion, circulation, respiration, metabolism, heat, excretion, nervous system, muscle, special senses, psychology and reproduction, in the order given. The book is obviously intended for a compact résumé

rather than a text-book, as the physiologist can easily realize for himself by reading the chapter on the psychical faculties. This chapter is also too isolated from the rest of the book. In many places throughout the volume different topics are so closely packed as to make rather uncomfortable reading. On the other hand, the work contains many interesting touches and gleanings from the allied sciences of chemistry, bacteriology, pathology, diagnosis, etc., that go far to counterbalance this defect.

The author has dealt very fully with chemical matters, including tests for the presence of physiologically important compounds, but very sparingly with histology. The statement (p. 15) that "alanine is a constant constituent of all proteins" is hard to reconcile with the statement (p. 16) that "leucine is, with the exception of argonine, the most wide-spread of all the amino-acids which go to make up the protein molecule." It is also difficult to see how the "diagram to show that K. C. C. is greater than A. C. C." really shows anything except the difference between an "ascending" and a "descending" current. A. P. B.

DISEASES OF THE SKIN AND THE ERUPTIVE FEVERS. By Jay Frank Schamberg, M.D. Second Edition, Revised. Freely Illustrated. The W. B. Saunders Company, Philadelphia, 1911. Price $3.00.

This excellent book, to which we referred in terms of praise when the first edition appeared, now comes out in a second edition four years after the first. The chapter upon Pellagra has been much amplified. Vaccine therapy also receives thorough consideration, and the various forms of treatment by refrigeration, notably the use of solid carbon dioxide, are discussed. The article on the treatment of syphilis has been entirely rewritten in order to present an adequate picture of the use of salvarsan and other modern methods. There is also a chapter on the Wassermann reaction. A considerable number of illustrations are new, and notwithstanding the fact that they are black and white, they are remarkably accurate and clinically useful. Throughout the book numerous hints as to minute details concerning the technique of methods, diagnosis, and treatment are found. It is an excellent book for the practitioner.

PERSONAL HYGIENE AND PHYSICAL TRAINING FOR WOMEN. By Anna M. Galbraith, M.D. Illustrated. W. B. Saunders Company, Philadelphia, 1911.

We are told in the preface that the aim of this work has been to present in a clear and concise manner the fundamental physiological laws on which personal hygiene is based, together with the practical detailed directions for the proper development of the body and the training of the physical powers, their highest degree of efficiency by means of fresh air, tonic baths, prepared food and clothing, gymnastic and outdoor exercise, so that the tissues will be placed in the best possible condition to resist disease. A few rather crude illustrations are scattered through the volume. Plates showing the female form as shown in classical statuary, such as the Venus de Milo, are inserted, and there are a considerable number of plates showing posture and exercise which give good ideas as to what should be done to develop the different muscles of the body. Then follows another series of plates showing postures in various types of dancing. The book is one from which the physician can glean much upon which he can advise his patients, and is written in such a form that it can be given to an intelligent patient with advantage.

PHYSICAL DIAGNOSIS. Its Principles and Practice. By John C. DaCosta, Jr., M.D. Second Edition, Revised. Illustrated. The W. B. Saunders Company, Philadelphia, 1912. Price $3.50.

Dr. DaCosta having been engaged for a number of years in teaching this branch of medicine, is well prepared by reason of his labors not only to write a book upon Physical Diagnosis, but in this second edition to bring it well up to date. The book is one of the most complete, considering its size, which is to be found in the market. Opening with a discussion of the various methods which are employed in demonstrating physical signs and studying symptoms, it proceeds to a discussion of the

physical signs of various diseases. Almost every page is illustrated. The poorest illustrations in the book are those which deal with pathological specimens, but, after all, these are not the most important illustrations in a book of this character. We have no doubt that the present edition will prove as popular as the first.

CLINICAL DIAGNOSIS. A Manual of Laboratory Methods. By James Campbell Todd, Ph.B., M.D. Second Edition, Revised and Enlarged. The W. B. Saunders Company, Philadelphia, 1912. Price $2.25.

The first edition of Todd's Manual appeared in 1908, and was designed to present clearly and concisely the various laboratory methods which are in use in clinical medicine. It is by no means as exhaustive as some of the larger works upon this subject, but it is eminently practical and concise. Doubtless there are many physicians who have not the time to study the larger books who will find this a most useful manual for constant reference. The present edition has been brought well up to date.

A TEXT-BOOK OF MATERIA MEDICA FOR NURSES, INCLUDING THERAPEUTICS AND TOXICOLOGY. By George P. Paul, M.D. Second Edition, Thoroughly Revised. W. B. Saunders Company, 1911. Price $1.50.

As may be gathered from its title, this book deals with materia medica in a very brief form, but in an adequate manner, for the class of readers or students for which it has been prepared. It also gives the various remedial measures other than drugs which are commonly employed by physicians and nurses. The closing pages of the book deal with the strengths of drug preparations, synonyms of drugs, weights and measures, and a dosage table.

MINOR SURGERY. By Leonard A. Bidwell, F.R.C.S. Illustrated. Published for the University of London Press, Ltd., by Hodder & Stoughton & Henry Frowde, London, 1911.

This excellent book, which is an amplification of the course given by the author at the West London Post-Graduate College, is designed as a handy reference for practitioners and students. Under scrubbing the hands the author considers that the most efficient method of disinfecting them is to thoroughly rub them with a solution of biniodide of mercury and methylated spirit: In a book of this kind the strength of the solution should be given. Horsehair is regarded as the best material for suture, kept in 1:20 carbolic solution twenty-four hours before use. Saturated solution of picric acid is considered the best application for burns. Injections of bismuth are advocated in the treatment of sinuses. In describing the subcutaneous method of injecting large quantities of salt solution a somewhat futile way of maintaining temperature is advocated. A cannula pictured for intravenous injection is not such a one as would prove highly reliable; nor is the proctolysis appliance described one to be selected. Corns and warts are cured by treatment with solid carbon dioxide. There is an excellent summary of methods of treating ingrowing nails. The technique of salvarsan injection is given with fairly satisfactory detail, as is lumbar puncture. Harelip is briefly touched upon, but not the most approved way of applying straps for the purpose of preventing pull upon the sutures. There is a chapter devoted to Minor Surgery of the Urinary Tract, in which the removal of a pin from the urethra is described by means of illustrations. Under Minor Surgery of the Rectum is classed the treatment of piles. Plaster-of-Paris splint is described in considerable detail. There is an appendix dealing with vaccination, von Pirquet's test, how to obtain a sample of blood for examination, Wassermann's reaction, Bier's congestion treatment, removal of wax from the ear, and the treatment of fractured femur in infants.

The book contains much that is serviceable to both the hospital interne and the practicing physician.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

The New Year has opened inauspiciously in the labor world with the threat of a national strike in the coal-mining industry. Reports of wintry weather from the other side of the Atlantic have raised fears on this side that the present cold snap is ushering in a period of hard weather. If such prove to be the case, the threat of the coal-miners will become the more effective, for they appear to be playing a game of bluff, their coffers having been depleted by recent costly strikes. As, however, the miners are bound to give a month's notice of their intention to strike there is still plenty of time for conciliatory measures.

The Royal Commission on Tuberculosis have issued another instalment of the Appendix to their final Report, which contains complete details of the experiments and observations upon which the conclusions of that Report were founded. This volume, which owing to its fulness of detail and accuracy with which the experiments are described will prove of great value to other workers, gives the results of the investigations into the characters of viruses obtained from cases of lupus. Cultures obtained from human cases of lupus were tested upon the calf, rabbit, monkey, and other animals. The general result has been to show that cultures from the lupus viruses fall readily into one of the two main divisions as far as their cultural characters are concerned, but experiments on animals have shown that few of the cultures possess the degree of virulence which their characters would indicate. Of nine cultures which grew like bovine tubercle bacilli only one was found to possess the high virulence with which such growth would usually be attended. As the result of exhaustive experiments the conclusion was reached that the lupus type of bacillus cannot be regarded as an intermediate stage between the bovine and the human types, but that the bacilli of lupus which approximate to the human type are really degenerate forms of that variety, and must not be regarded as intermediate forms, or as standing in any other relation to the types from which they differ in cultural characters.

The agitation against the National Insurance Bill still goes merrily on. The Reform Committee of the British Medical Association has issued a manifesto to the profession in general and the members of the Association in particular, giving an outline of its policy and objects. The committee has been organized by those who consider that the present Council of the B. M. A. have betrayed the interests of the profession by allowing themselves to be influenced by political considerations and by not having secured the minimum demands which were laid down in a mass meeting of the profession as necessary before they would coöperate in working the Act. The committee is of the opinion that the present Council must be either "mended or ended" before the confidence of the members of the Association in their official leaders can be restored. The existing Council think that the matter of remuneraton for medical services may now be left in the hands of the Insurance Commissioners to be dealt with in their regulations, but the Reform Committee directly opposes this policy, and is of the opinion that the best method of obtaining the end in view is by the promotion of an Act of Parliament through the British Medical Association amending the Insurance Act in such a manner as will embody the minimum demands of the profession. The Association has announced that already between 26,000 and 27,000 signatures have been appended to the undertaking drawn up with the object of consolidating the attitude of the profession toward the Act. As it is estimated that of the 32,000 practitioners in Great Britain only 24,000 are available for service under the Act, the number of undertakings is more than enough to

make that measure a dead letter as far as the medical benefits are concerned. The serious loss with which hospitals are threatened is emphasized by the chairman of the London Hospital in an appeal to the public to be more generous in their subscriptions. He complains that many people, alarmed at the Insurance Act, are already withdrawing their subscriptions, while as yet no payments have had to be made under the Act. In the meantime the hospitals have their usual expenses to meet, and it is possible the number of patients to be treated may increase. It is pointed out in the appeal that the Act makes no provision for the more serious illnesses which cannot be treated at home, nor for operations which require the experienced surgeon and the fully trained nurse. For all these cases the hospitals must still make provision, and if the public refuse the support they have hitherto given all voluntary institutions will have to go on the rates or become state managed.

Canon Henson recently gave a most interesting lecture on "Christianity and Faith-healing." He said that an attempt was being made to bring within the categories of modern science the persistent phenomena of "spiritual healing," and that there was a tendency to materialize religion under the pretence of spiritualizing science. The lecturer pointed out that faith-healing was coeval with religion itself, and was in no wise distinctive of Christianity, that it appeared to be limited in its efficacy and to be identical in all but name with healing by means of suggestion, and that therefore it offered no real exception to the known procedures of nature. That faith-healing has no necessary connection with moral excellence in either the "healer" or the "healed" is proved by the circumstance that Charles II. was the busiest "healer" on record. He touched for the king's evil over 92,000 scrofulous persons, and it is instructive to note that while in no other reign were so many people touched for scrofula and so many cures vouched for, in no other reign did so many people die of that disease. In conclusion the lecturer observed that the progress of medical and surgical science had been conditioned throughout by its emancipation from theological presuppositions, and that it was incredible to think that there could be any return to the old bondage.

The new government order for the compulsory notification of consumption has raised several important questions of local government and taxation. At present the cost of the doctors' fees for notifying infectious diseases is spread equally over the whole of London, but the present order has been framed in such a way that the expense of administering it will fall upon the City of London and upon each metropolitan borough. The heaviest burden will thus fall on boroughs in which the ratable value per head is low and the rates are high. In these cases overcrowding is common and the death-rate is usually high. It would seem that this service is one to which the principle of equalization of burden is specially applicable. A book has just been published entitled "The Control and Eradication of Tuberculosis," which contains a series of international studies of the working of hospitals and sanatoria in different parts of the world. These studies should prove of great interest to all those who have taken any part in the great anti-consumption crusades which are now being waged in practically every civilized country in the world.

PARIS LETTER.

BY M. A. C. TUCKER, M.D.

In French medical circles attention has been drawn to a rather curious medicolegal action which has just been decided in Austria. To put the case in a nutshell, civil proceedings were taken against a gentleman who had used his influence over a friend who had been grievously wounded in the foot, the wound subsequently becoming gangrenous. The doctor told his patient that the only means of saving his life was to have the limb amputated, to which the sufferer readily consented; but the friend in question, chancing to come in a

little later, used so well his eloquence to dissuade him from submitting to the operation that the unfortunate man rescinded his former decision and refused pointblank to allow the surgical operation to be performed, and soon departed this world in consequence. The grieved family sued the meddler, who for his interference got mulcted in substantial damages, the jury charging him besides with being guilty of having—whilst the life of the man could still be preserved—given such ill and imprudent advice, and of having made use of such undue influence, that death had become unavoidable. For once, the old proverb, "The advisers are not the payers," is decidedly at fault in this case, for this particular counselor, after having appealed to and exhausted all the jurisdictions of his country, has just seen all former judgments against him finally upheld by the Supreme Court.

It is illicit, *ergo* illegal, in France for a doctor or a surgeon to sell to another practitioner his ever-so-long acquired or established *clientèle,* the surgical or medical *clientèle,* as the law goes, "not being commercial or tradable items," for they depend chiefly upon the personal professional qualities of the person, and moreover in the confidence individually inspired. But taking into consideration certain clauses of such a contract, the Paris tribunals have just held that the cession of a dentist's cabinet stands perfectly valid when it carries in the agreement the leasehold rights of the establishment, with the additional mention clearly posted outside the premises and on all the stationery that the dentist has transferred his practice to another.

The French law of 1895 forbids expressly the use or the sale of any serum without leave from the state, which can only be obtained after it has been thoroughly tested by the Academy of Medicine and by the Pasteur Institute and favorably reported upon. The excuse put forward by a Dr. Regnier that an antisyphilitic serum of his, extracted from the blood of inoculated monkeys and sold only to qualified medical men, on their personal demand, is no defense, and consequently Dr. R. was fined one hundred francs.

The Court of Cassation has recently delivered an interesting judgment in relation to the compulsory sanitary examination (*visite sanitaire*) of prostitutes. It determines that the simple inscription of the name of the habitual *fille publique* upon the police registers creates against her a presumption which can only be dismissed by properly established evidence to the contrary. In this particular case the appellant had invoked the motive that she had for some time abandoned the streets, urging that she was now married. But, in rejecting the woman's petition, the higher magistrates explained that such grounds should have been raised before the tribunal below, where the judge, after careful consideration, was fully entitled to decide whether it was a genuine and deserving case of rehabilitation. Meanwhile, the public's interests and health must be protected and the law take its full course.

The sempiternal controversy relating to the doctor's professional secret is far from being exhausted. One of the most delicate points for a doctor is the attitude he should adopt when questioned upon the occasion of a projected marriage, to give—as far as it is feasible—satisfaction to the legitimate desire of the family without betraying *le secret professionnel.* Evidently, medical men are unanimous in declaring that it is impossible to commit oneself under such direct interrogations, but many of them are in search of an expedient to satisfy all the interests at stake. In my personal opinion there is no possibility of that kind. Whenever you allow a third party to be informed of what you have learned about a person in the exercise of your medical capacity, you betray the medical secret, even if the third party receiving your confidence is a medical gentleman. It has been suggested that the medical attendants of both families in case of a prospective marriage could be called together and hold privately a sort of consultation, at the end of which they could

declare whether the wedding might take place or not. It is obvious that the thing is absolutely impracticable. It certainly could be done without disclosing the exact diagnosis of any particular disease, but in most cases the professional confidence would be broken, as the declaration of inability or incapacity of one of the two *fiancés* could be derived only from confidential information from one doctor to the other upon the anterior healthful state of his patron. Moreover, if such a consultation was held without the entire and full consent of all concerned, the aggrieved party, if any, would most likely become entitled to pretty heavy damages. But if, on the contrary, both families had willingly acquiesced in such a course, there would assuredly be no danger of legal proceedings, but the professional secret would none the less have been violated. As a matter of fact, no medical authority worthy of the name should be inclined to depart, generally speaking, from the most prudent reserve even toward his own client. On the other hand, if you speak to-day in favor of a perfectly healthy party, and if you refuse to speak to-morrow for another, the natural inference is that the latter is condemned by you. It is, however, quite comprehensible that, in such particular predicament, parents and guardians will be anxious to know a little about the state of the future bride or bridegroom, and it is hoped that in future such display of interest will be oftener manifested. The only possible way out of the dilemma might be either to obtain a certificate from one's own doctor which could be used or destroyed, or that the interested families, by mutual request and assent, should demand and exchange health certificates, the formality being accepted or declined, according to case and circumstances.

It is an averred fact that the French population is steadily decreasing by little and little. The subject is watchfully scrutinized by legislators here, and it is sorely evident that in a comparatively short period the nation will become steadily weakened if large families are not helped and protected instead of being discouraged and heavily burdened as they are. In the present state of things, working classes in this country are completely unable to bear the multifarious charges attached to the bringing up of several children. Rent, food, clothes, and other items are nowadays so hard to procure that it is quite an impossibility for a workingman or an employee to cope with the most elementary daily requirements.

ALCOHOL IN TRACHOMA.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: Having read an article in your journal of October, 1911, on the treatment of "Trachoma with Carbon Dioxide Snow," and having had such good results in its treatment with alcohol, I thought I would write you explaining its use. I have not had the opportunity of using it extensively, but in my few cases it has proved so much superior to the old treatment with bluestone, silver nitrate, etc., that I would like to see it tried more extensively.

I use it as follows: After dropping some cocaine solution in the eye, as a local anesthetic, I evert both lids, dry them with cotton, and by means of a cotton holder I use the alcohol full strength, applying it thoroughly to all parts of the conjunctiva, being careful that none of it gets on the cornea, although if some did it would cause but little disturbance. This treatment is readily managed by any one who understands the technique of conjunctiva medication. After applying the alcohol a short interval is allowed to elapse before returning the lids to their place. The cases that I have found to respond most readily to this treatment are the same as those referred to by Dr. Harston, namely, the chronic and those in which there is scar tissue.

I was led to the use of this remedy by recognizing the germicidal properties of alcohol and its power to penetrate, and from the fact that the caustics usually employed do not reach to the seat of the disease.

SEWARD, NEBR. H. B. CUMMINS, M.D.